

Rancho Cantera, LLC  
Kent, IL

Comprehensive Nutrient  
Management Plan

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## **Outline of CNMP Document**

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<b>Section 2</b>	Notes to Reviewers
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<b>Section 23</b>	Field inventory & yield info Expected crop rotation & yields
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<b>Section 27</b>	Manure Easements
<b>Section 28-29</b>	Individual field information Includes maps with application setbacks, soil test P & K values, crop rotation, expected yields, predominant soil type
<b>Section 30</b>	Planned vs. Actual Manure Applications, "tractor cab sheets"
<b>Section 31</b>	Recordkeeping Sheets– keep on file for 5 years Producer checklist Manure application information, including weather conditions Manure transfers off-site, Farm crop records, Mortality records, CNMP reviews, Facility inspections, Application equipment calibration

*This CNMP was developed using estimated manure production. Estimates and actual numbers may vary based on climate, animal inventories, etc.*

## ***Plan Recommendations for EQIP application & cost-share***

### **Manure & Wastewater Storage & Handling**

- Producer is proposing to add an offsite pump and pipeline system to the facility. This will allow for the producer to more efficiently apply waste to fields that are farther from the facility.

***Waste Transfer – Practice Code 634 (offsite pump with pipe < 5,000')***

### **Land Treatment Practices**

- Fields meet T under current and planned management and rotations.

### **Nutrient Management**

- Producer may apply for the waste utilization incentive. Producer would need to implement two of the practices outlined on the following page titled Guidance for Implementation of Waste Utilization Plans including soil testing of the fields on 2 ½ acre grids. Acreages eligible for waste utilization incentive dollars are estimated on the following pages. Maps for all fields show setbacks from surface waters.

***Waste Utilization – Practice Code 633***

### **Producer Signature**

*I certify that all information contained within this plan is truthful and accurate to the best of my knowledge.*

**Rancho Cantera**

**(b) (6)**

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

### Attachment 3

## Guidance for Implementation of Waste Utilization Plans

To qualify for receiving the Waste Utilization incentive payment, the applicant must have an NRCS approved CNMP that includes the benchmark use of current Waste Utilization practice. Also, the CNMP must outline implementation of the Waste Utilization practices showing two or more of the following management changes. (circle all that apply):

1. Fields where manure is or will be applied will have new soil tests if existing soil tests are older than four years. Manure from each storage facility will be tested as close to the planned application dates as possible. Manure application rates will be based on recent soil and manure tests. *(If part, but not all, of this item is currently in place and the applicant will implement the entire item using EQIP dollars, the applicant may get credit for this item as one of the two management changes to qualify for the Waste Utilization incentive payment.)*
2. If waste is currently being applied closer than ¼ mile from a water body, increase the distance between manure application and water bodies by at least 200 feet.
3. Discontinue applying waste within 200 feet of wells, sinkholes, or surface waters.
4. Discontinue applying waste to cropland with slopes greater than 15%.
5. Discontinue spreading waste on frozen or snow-covered soil over 5 percent slope.
6. Install provisions such as contour buffer strips, stripcropping, grass or grass-legume cover or heavy residue cover on lands over 5 percent slope that are receiving manure, to control runoff and pollution so that manure may be spread on frozen or snow-covered soil.
7. Discontinue applying liquid manures to soils with less than 10 inches of at least moderately permeable soil over fractured bedrock, sand, or gravel.
8. Discontinue application of waste on organic soils with a seasonal water table within 1 foot of the surface.
9. Discontinue application of waste on flood plains where flooding occurs more frequently than once in 10 years.
10. Change application method from surface application or immediate incorporation to injection.
11. Discontinue application of waste in areas of concentrated water flow.
12. Change manure management to result in the total nutrient content of the manure being applied to the land to be at least 10% less than the CNMP would allow.

**Examples:**

- a. Spread manure on 10% more acres than the minimum allowed in the CNMP. *(Note, the EQIP incentive will apply to the number of acres on which manure is to be spread, not to exceed 10% more than the minimum number of acres required by the CNMP.)*
- b. Adopt an alternative use for the manure (other utilization activities such as composting, etc)
- c. Change nutrient content of the manure to reduce Phosphorus content by at least 10% (ie. Feed management).

**NOTE:** Qualifying acres for the Waste Utilization incentive payment include all land where manure is to be applied (owned or controlled by the applicant, or on which the applicant has a contract to apply manure). The Waste Utilization incentive payment cannot be paid on land where "Other Utilization" options are used. "Other Utilization" includes options such as manure being hauled away and land applied by a third party (not the EQIP applicant).



Waste Utilization Incentive Acreage  
Rancho Cantera LLC

Farm#	Tract #	Field #	Common Name	Acres	2011	2012	2013	2014	Average
562	1970	14	R/C 116	112	0	112	112	112	
562	1970	5	R/C 19.1	19	0	19	19	19	
562	1970	7	R/C 40	42	42	42	42	0	
562	1970	3	R/C 8.1	8	8	0	8	8	
562	1970	1	R/C 2.5	3	0	0	3	3	
562	1970	2	R/C 24.2	24	24	24	0	24	
562	1970	15	R/C 4.9	5	0	5	0	5	
			(b) (6)	61	61	61	61	61	
			(b) (6)	76	76	76	76	76	
			(b) (6) 56.4	56	56	54	56	56	
			(b) (6)	5	5	5	5	0	
			(b) (6) 2	25	25	25	25	25	
			(b) (6) 24.5	60	60	60	0	60	
			R/C 135.3	143	75	82	143	143	
			(b) (6) 40	25	0	25	25	25	
			(b) (6) 120	85	85	85	85	85	
			(b) (6) 80	47	47	47	47	47	
			(b) (6)	67	67	67	67	67	
			(b) (6) 25	23	0	23	23	23	
			(b) (6) 5	15	0	0	15	15	
			(b) (6) 90	83	83	83	83	83	
			(b) (6) 50	40	40	40	40	40	
			(b) (6) 160	133	133	133	133	133	
			(b) (6) 40	40	40	40	40	40	
			(b) (6)	148	148	148	148	148	
			(b) (6)	77	77	77	77	77	
Total					1153	1333	1334	1376	1299

## **NOTES TO REVIEWERS**

### **MWWSH**

This dairy facility consists of 1400 head of dairy cattle. The cattle are housed in freestall buildings and all waste is transferred to the existing earthen storages. The existing earthen storages will provide over a year of waste storage.

### **Land Treatment**

All fields meet T under planned management and rotations.

### **Nutrient Management**

Producer has 1,423 acres of land available for manure application that is part of the dairy facility. Soil tests are available for only a portion of the fields. For those acres where soil tests are not available manure applications were planned at a P rate. Recommendations are to get soil tests up to date on all acres where applications are to take place. Soil tests are to be taken on 2.5 acre grids.

Producer does not have manure analysis for the facility. It is recommended that manure analysis be taken to verify actual nutrient content of waste.

## NPDES Documentation Index

<i>Documentation</i>		<i>Location in Document</i>
<b>General Facility Information</b>		
	General Facility Information	Section 2 & 6
	Personnel Information	Section 8
	Emergency Contacts	Section 8
	Facility Infrastructure	Section 5 & 6
	Summary of Maps	
	<i>Topographic Map, Aerial Map, Flood Zone Map, Plat Map</i>	Section 4
	<i>Soil Maps</i>	Section 28 & 29
<b>Facility/Production Area Information</b>		
	Facility Working and Design Capacity	Section 7
	Storm Water Pollution Prevention	Section 17
	Facility/Production Area Storm Water Pollution Prevention Plan	Section 17
	Mortality Disposal Options	Section 12
	Mortality Disposal Discharge Prevention Best Management Practices	Section 10
	Mortality Disposal - Record Sheet	Section 31
	Yearly Mortality Summary Table	Section 31
	Chemical Wastes and Raw Materials Discharge Prevention	Section 17
	Use Exclusion (Fencing Livestock from Surface Water)	N/A
	Temporary Manure Stack Discharge Prevention	N/A
	Facility Maps	Section 4
<b>Manure Storage Information</b>		
	Manure Storage Descriptions and Dimensions	Section 6 & 7
	Determination of Manure Storage Working Volume and Annual Manure Production	Section 7
	Storage Volume Calculation and Determination of Adequate Size	Section 7
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	Field Maps	Section 28 & 29
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	Lease Agreements for Application Fields	Section 27

## NPDES Documentation Index

<i>Documentation</i>	<i>Location in Document</i>
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<b>Crop Rotation and Nutrient Needs Print Individual Forms</b>	
Planned Manure Applications	Section 28-30
Crop Rotation and Nutrient Needs	Section 23, 28 & 29
<b>Planned Field Application Summary</b>	
Manure Application Equipment Methods	Section 6 & 10
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<b>Manure Storage Inspection</b>	
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Off-Site Transfer of Manure to Third Parties	Section 31
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<b>Manure Application Equipment Calibration</b>	
Check Calibration Method Used	Section 31
Load Area Method of Calibration	Section 10
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Fire Emergency Response Information Sheet	Section 8
Location of Pre-Arranged Emergency Equipment and Supplies	Section 8
Emergency Action Plans	Section 8
Emergency Map	Section 8

### **Rancho Cantera Info**

**To meet Dept. of Ag requirements, you need to:**

**Soil Test**

**Take annual manure analyses (at least until stable)**

**Apply at agronomic rates according to analyses**

**Obey setbacks**

**200' from water**

**200' from wells (NRCS requirement)**

**¼ mi. from residences IF you have to surface apply**

**no setback from residences IF injecting**

**To meet CAFO requirements:**

**You do NOT need a NPDES permit, UNLESS you discharge**

**Your facility should be a "no discharge" facility, EXCEPT in the case of a tanker turnover or accident, or drag hose rupture AND that spill reaches a "navigable water" (navigable is yet to be defined)**

You DO NOT have a discharge based on land application (i.e. large unexpected rainfall after an application causes a fish kill downstream), IF you have a nutrient management plan, AND you are following it!

*To meet IEPA requirements, all records shall be maintained in accordance with section 4.e. (i-x) of the general permit.*

# Comprehensive Nutrient Management Plan

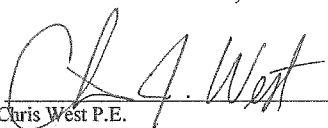
## Warranty of Technical Services Provided

I hereby warrant that the technical services I provided as a Technical Service Provider:

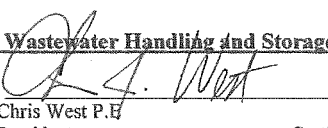
- 1) Comply with all applicable Federal, State, Tribal, and local laws and requirements
- 2) Meet Applicable USDA standards, specifications, and program requirements,
- 3) Are consistent with and meet the particular conservation program goals and objectives, and
- 4) Incorporate, where appropriate, low-cost alternatives that address the resource issues.

**Farm contact information:** Rancho Cantera LLC  
2866 N. Sunnyside Road  
Kent, IL 61044

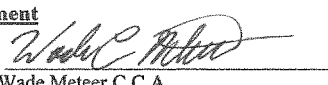
### Total Plan

Signature:  Date: 12-2-10  
Name: Chris West P.E.  
Title: President Certification Credentials: TSP # 04-4217


### Manure and Wastewater Handling and Storage

Signature:  Date: 12-2-10  
Name: Chris West P.E.  
Title: President Certification Credentials: TSP # 04-4217

### Land Treatment

Signature:  Date: 12-2-10  
Name: Wade Meteer C.C.A.  
Title: Agricultural Scientist Certification Credentials: TSP # 08-5938

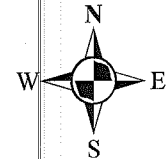
### Nutrient Management

Signature:  Date: 12-2-10  
Name: Wade Meteer C.C.A.  
Title: Agricultural Scientist Certification Credentials: TSP # 08-5938










# Rancho Cantera

## Aerial Photo



### Legend

-  Fields
-  Water
-  Water Buffer
-  Wells
-  Well Buffer
-  Existing Land Treatment
-  Livestock Facilities

6,500

Feet



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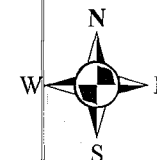
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


# Rancho Cantera

## Aerial Photo



### Legend

-  Fields
-  Water
-  Water Buffer
-  Wells
-  Well Buffer
-  Existing Land Treatment
-  Livestock Facilities

3,400

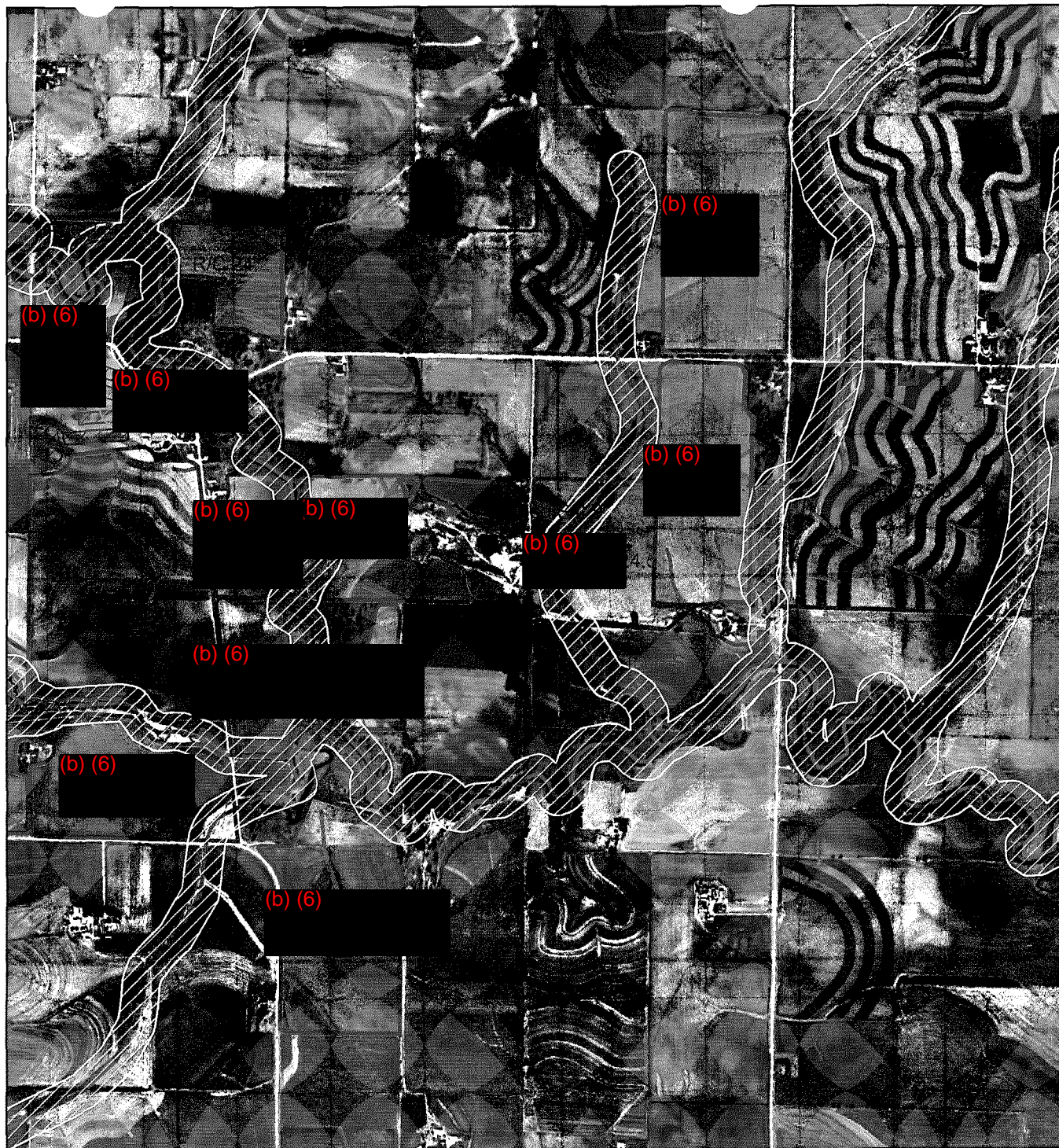
Feet



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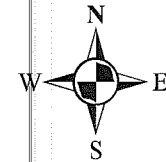
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


# Rancho Cantera


## Aerial Photo



### Legend

-  Fields
-  Water
-  Water Buffer
-  Wells
-  Well Buffer
-  Existing Land Treatment
-  Livestock Facilities

4,200

 Feet



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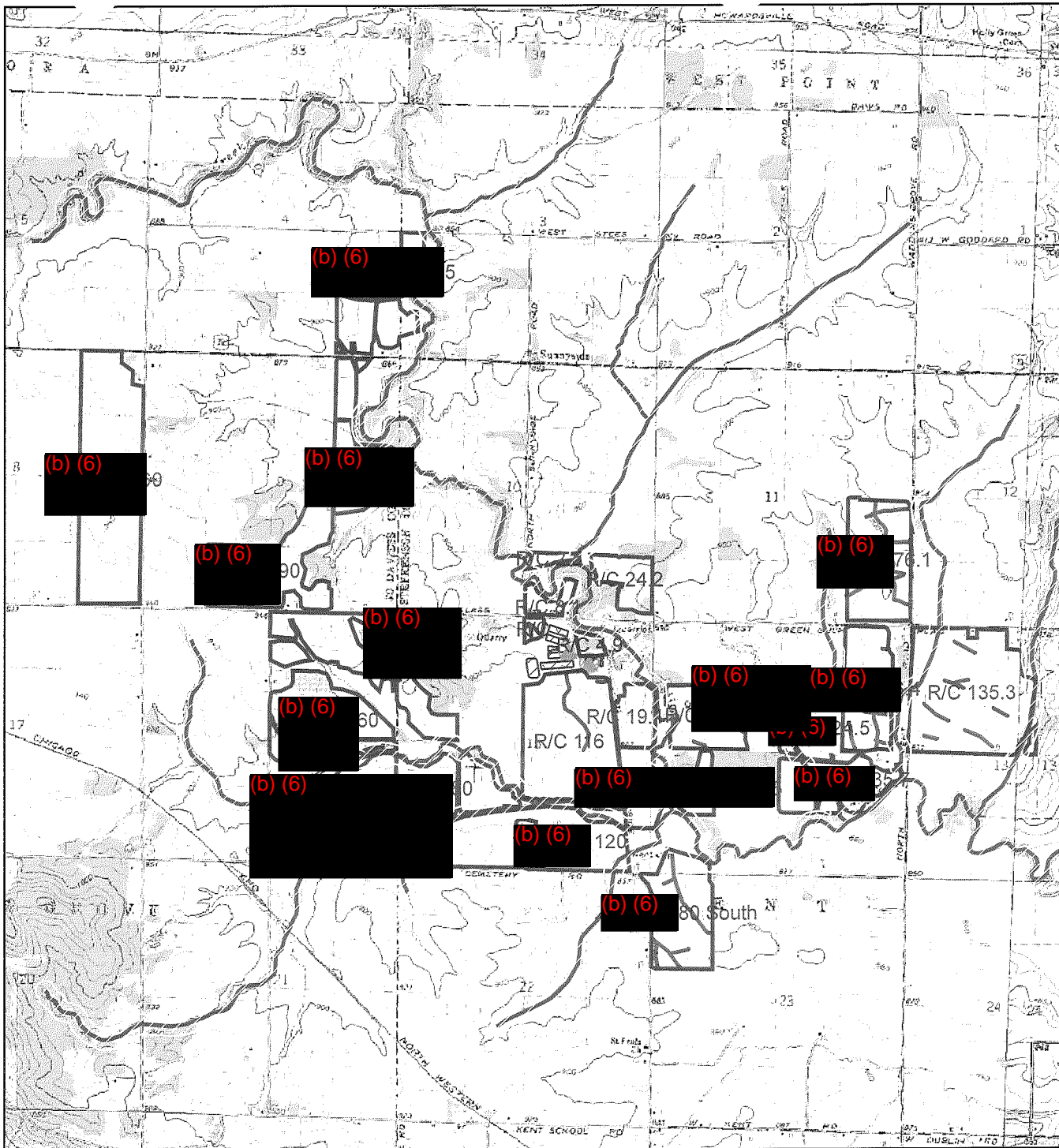
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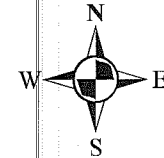
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






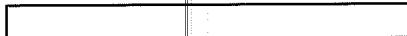
# Rancho Cantera Topo Map



## Legend

-  Fields
-  Water
-  Water Buffer
-  Wells
-  Well Buffer
-  Existing Land Treatment
-  Livestock Facilities

6,600

 Feet



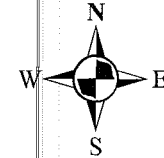
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# Rancho Cantera Topo Map



## Legend

- Fields
- Water
- Water Buffer
- Wells
- Well Buffer
- Existing Land Treatment
- Livestock Facilities

3,250

Feet

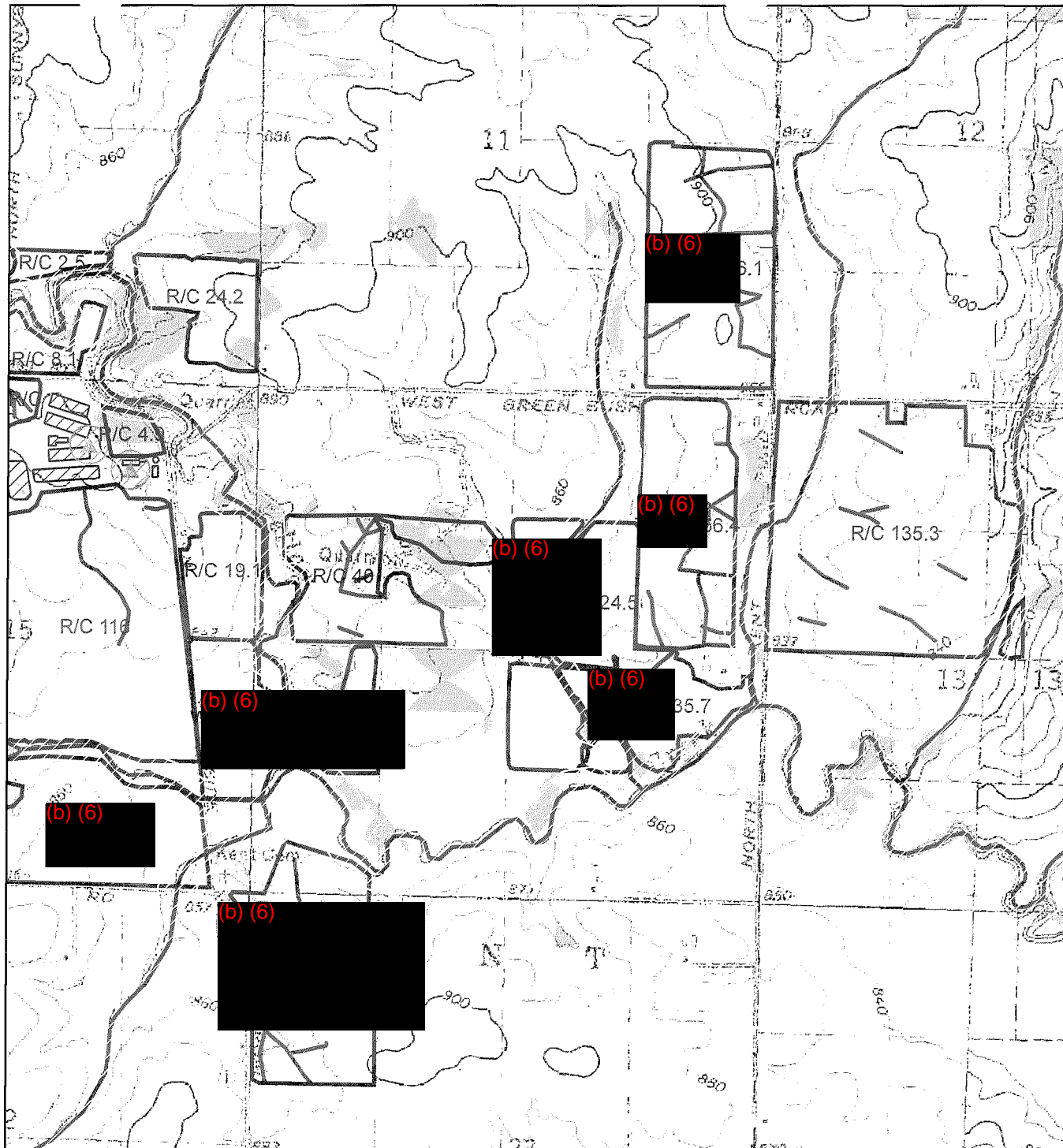


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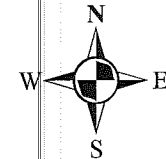
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# Rancho Cantera Topo Map



## Legend

- Fields
- Water
- Water Buffer
- Wells
- Well Buffer
- Existing Land Treatment
- Livestock Facilities

4,100

Feet

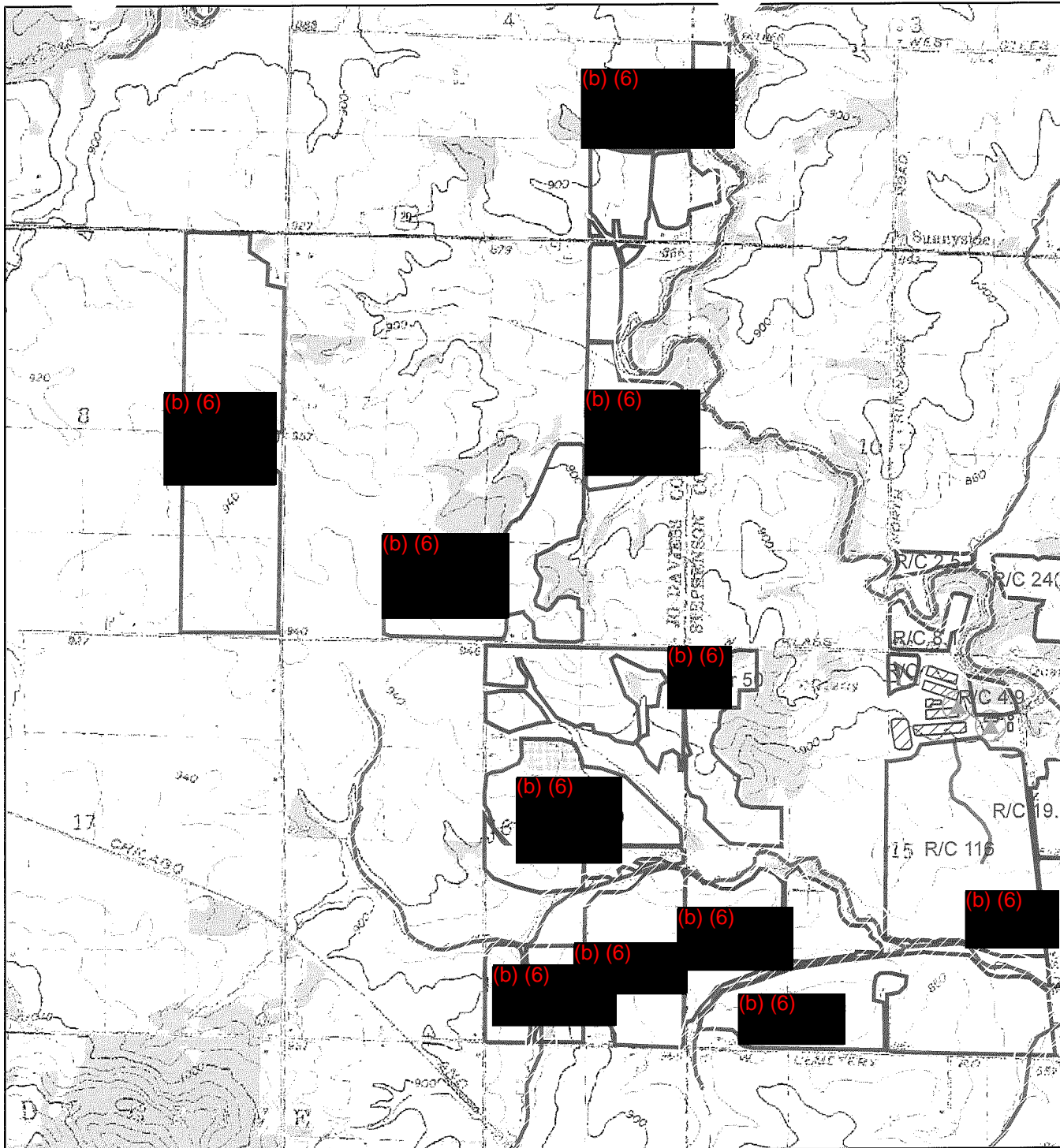


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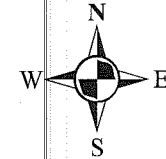
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# Rancho Cantera Flood Zone Map



## Legend

-  100 Year Flood Zone
-  Fields
-  Water
-  Water Buffer
-  Wells
-  Well Buffer
-  Existing Land Treatment
-  Livestock Facilities

8,500

Feet

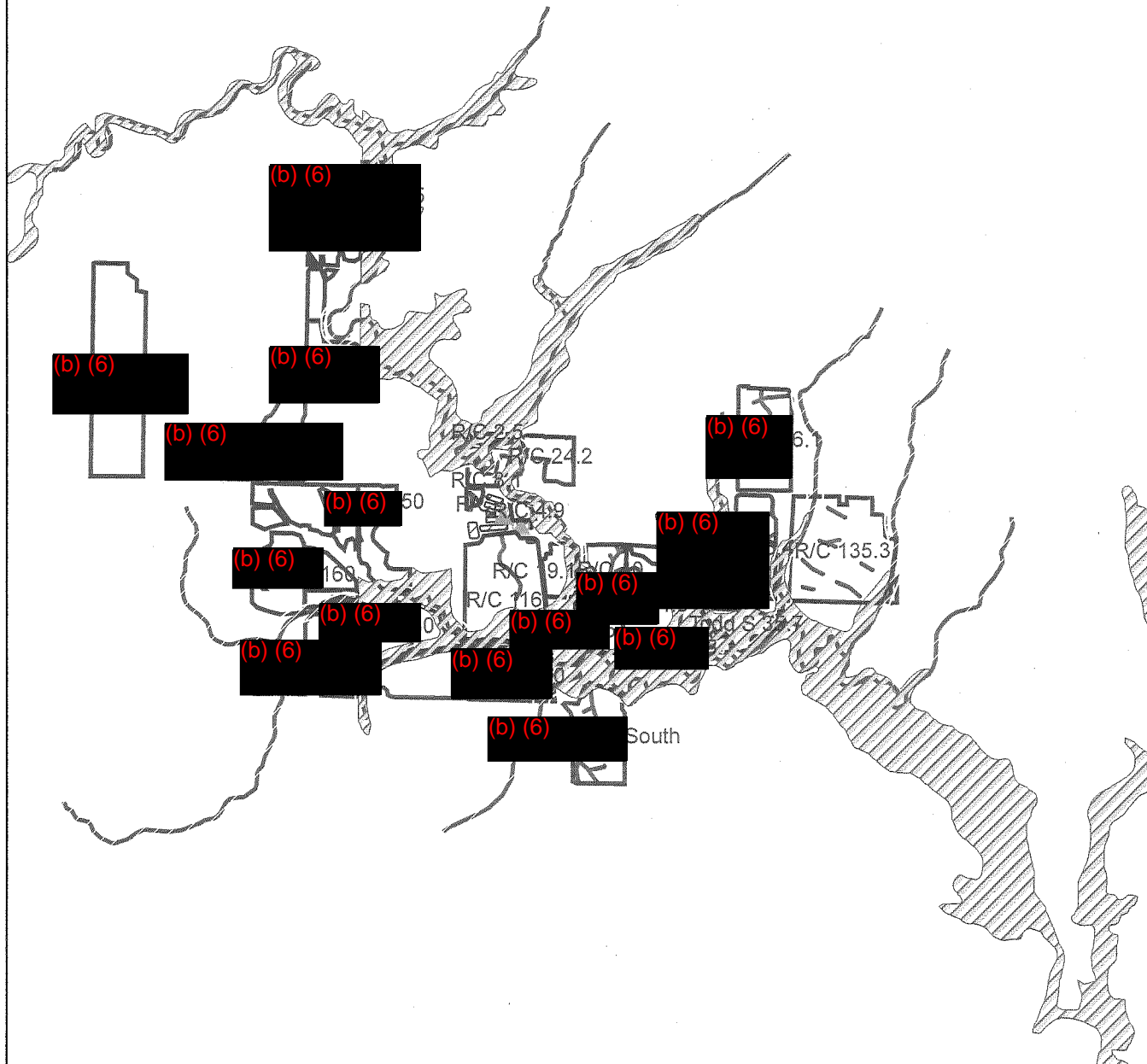


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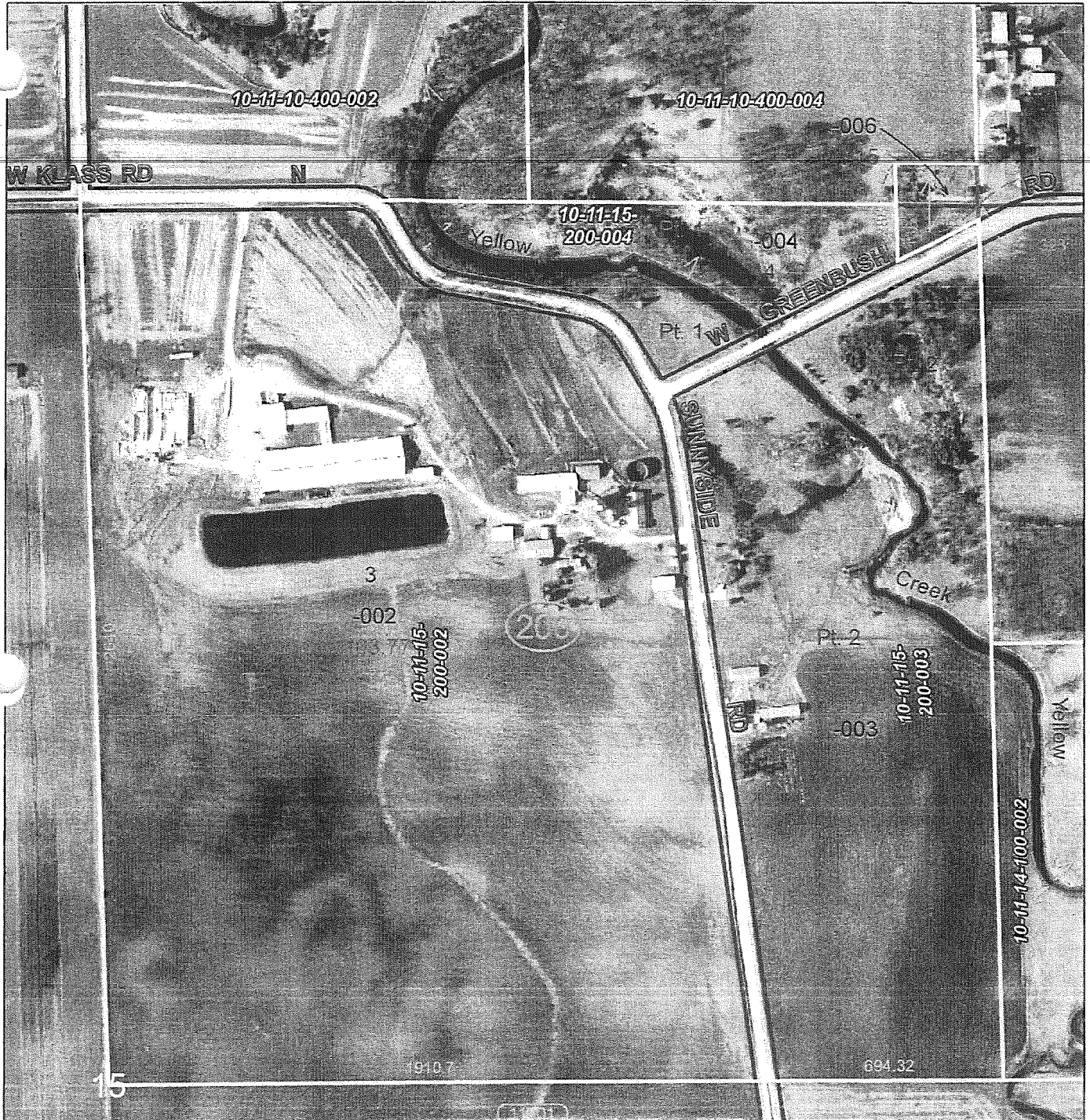
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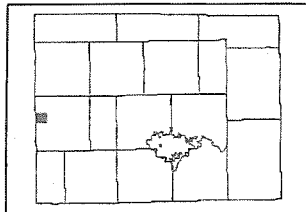


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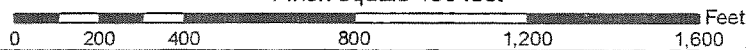


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(815) 235-8260

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1 inch equals 400 feet



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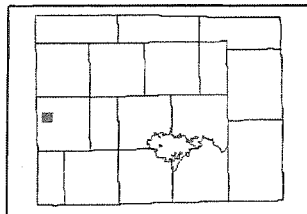


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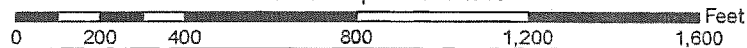


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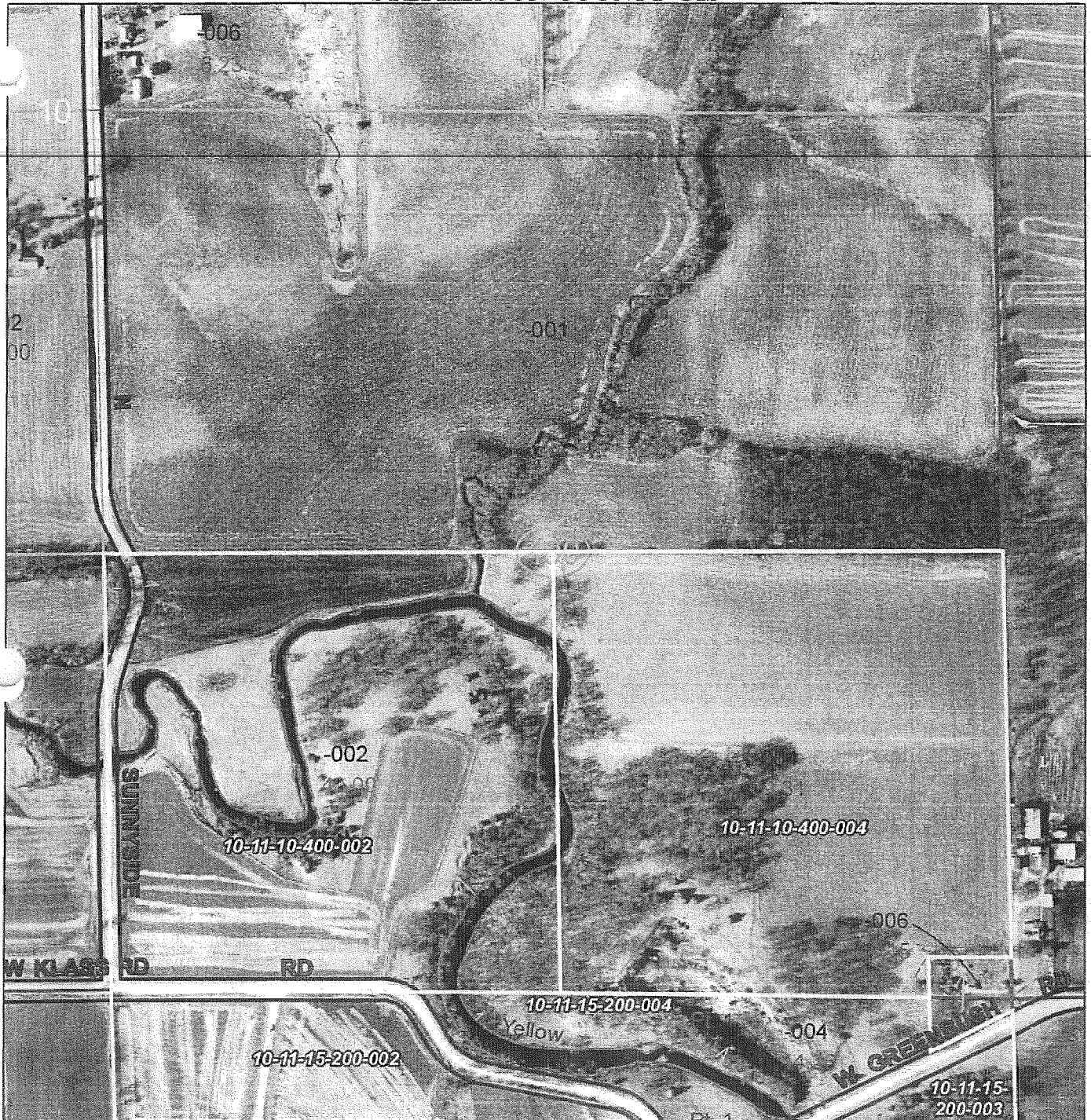


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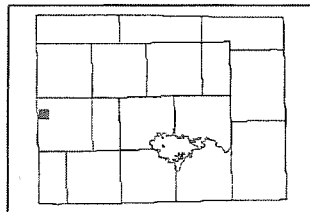


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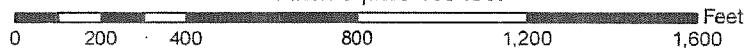


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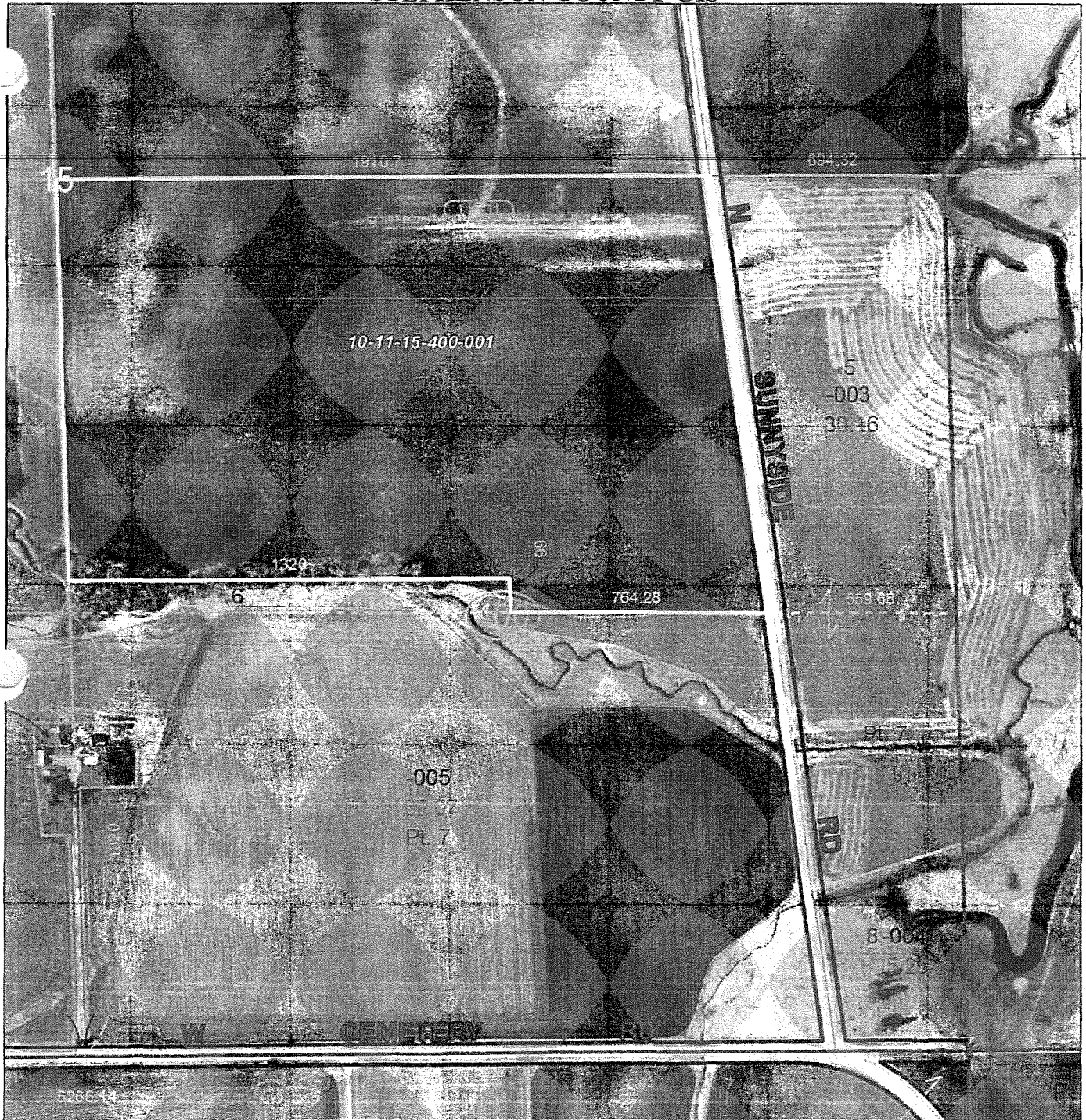
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COUNTY GIS DEPARTMENT.



# STEPHENSON COUNTY GIS

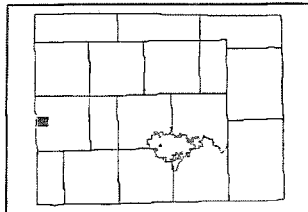


STEPHENSON COUNTY  
GIS

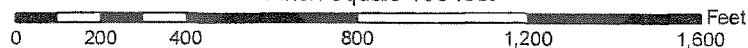


15 N. Galena Ave.  
Freeport, IL 61032  
(815) 235-8260

PHOTOGRAPHY CURRENT  
AS OF 04/11/2003



1 inch equals 400 feet



STEPHENSON COUNTY ASSUMES  
NO LEGAL RESPONSIBILITY  
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COUNTY GIS DEPARTMENT.

## **Site Information**

### **A. Site Description**

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Rancho Cantera, LLC. operates a 1400 head dairy in Stephenson County Illinois.

The dairy consists of a 500 head freestall building that measures 423' x 111', a 600 head proposed freestall building that measures 480' x 116' and a 400 head freestall building that measures 400' x 116'. All animal housing structures can be seen on the plot plan on the following page. In addition to the freestall buildings the facility has an existing earthen storage that measures 181' x 743' and 456' x 257'. All waste from the facility is to be flushed to the earthen storage.

The facility also has a separate silage and commodity pad. All stormwater drainage from the pad is directed into the earthen storage as well.

Approximately 1,423 acres are available for manure application. The application acres are in a continuous corn rotation. Preference for manure is to apply in the fall for next years corn crop. Fields are fall chisel plowed, spring field cultivated, and planted. Soil test values for Phosphorus and Potassium are included with the individual basic field information. Risk assessments for Phosphorus and Nitrogen are included in section 16. Recommended manure application rates are found in the Summary Table (section 19), and comply with all provisions of NRCS IL 590 Standard.

In addition to the acres in which the facility owns and applies waste on, the producer markets a large amount of the waste from the facility for fertilizer value. The producer has secured neighboring farmers who which to transfer manure for nutrient application.

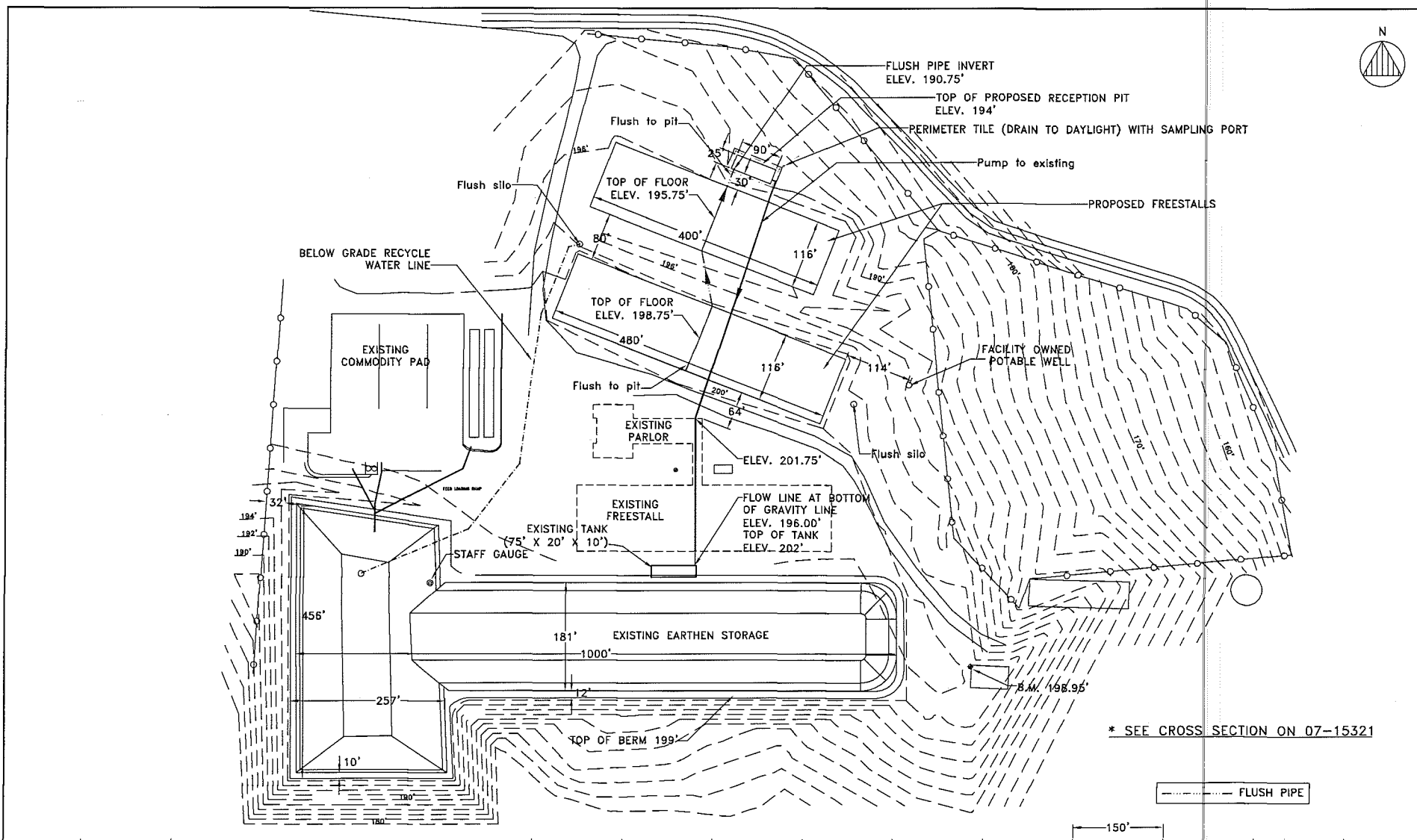
Mortalities are handled by a rendering service.

Site soil and geological information is located on the following page.

The Facility itself is located in the NW ¼ of the NE ¼ of section 15, Township 27 North Range 5-East of the 4<sup>th</sup> P.M.

Table A-1 Site Soils and Geologic Information			
Soil Type	Soil Name	Hydric Soils Class	High Water Table
61A	Atterberry silt loam, 0-2% slopes	B	0.5-2.0 ft.
279B	Rozetta silt loam, 2-5% slopes	B	4.0->6.0 ft.
280B	Fayette silt loam, 2-5% slopes	B	- -
280C2	Fayette silt loam, 5-10% slopes, eroded	B	- -
429C2	Palsgrove silt loam, 5-10% slopes, eroded	B	- -
675B	Greenbush silt loam , 2-5% slopes	B	4.0->6.0 ft.
675C	Greenbush silt loam, 5-10% slopes	B	4.0->6.0 ft.
735D2	Casco-Rodman-Fox Complex, 6-12% slopes, eroded	B	- -
8074A	Radford silt loam, 0-2% slopes, occasionally flooded	B	1.0-2.0 ft.
8451A	Lawson silt loam, 0-2% slopes, occasionally flooded	C	1.0-2.0 ft.

*Note: Information Obtained from USDA NRCS Stephenson County EFOTG*



**Frank & West**  
Environmental Engineers, Inc.

7226 N. State Route 29  
Springfield, IL 62707

Phone: 217/487-7686  
Fax: 217/487-7687

RANCHO CANTERA, LLC.

PLOT PLAN

DRAWN BY: CEO

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SCALE: AS SHOWN DATE: 09/13/10 REVISED ON: 12/03/10 DRAWING NO. 07-15327

## **B. Facility Inventories**

### **1. Animals**

**Table B-1**

<b>Animal</b>	<b>No. of Animals</b>	<b>Avg. Size</b>	<b>Animal Units (LMFA)</b>	<b>Animal Units (per 1,000 lbs)</b>
Dairy Cattle	1400	1400	1400	1960
<b>Total Animal Units</b>			<b>1400</b>	<b>1960</b>

### **2. Buildings**

**Table B-2 Livestock Facility Capacity(s)**

<b>Facility</b>	<b>Facility Population</b>	<b>Total Square Feet</b>	<b>Storage Facility</b>
Existing Freestall	400	46,953	Existing Earthen Storages
Existing Freestall	400	46,400	
Existing Freestall	600	55,680	

### **3. Seasonal High Water Table**

- See Site Soils & Geologic Information Table (A-1)

#### 4. Livestock Waste Production

##### Livestock Waste Storages

**Table B-3**

Storage	Animals	Waste Produced (Gallons Annually)	Capacity (Gallons)	Storage Days
Existing Earthen Storage	1400	16,418,739	21,753,352	484
<b>Total</b>	<b>1400</b>	<b>16,418,739</b>	<b>21,753,352</b>	<b>484</b>

Total Livestock Waste Production

*See calculations on following page for manure production calculation details.*

#### 5. Rainfall Volumes & Evaporation from storage facilities

See following page for rainfall & evaporation calculations expected from lots & open storages.

## Bosma Dairy Waste Volume Calculations

DAILY MANURE PRODUCTION	Average (1)	Maximum	Total Manure (2)
	Animal Weight (lbs)	Design Capacity # of Head	Production (cu.ft./day)
Dairy Cattle	1,400	1,400	3,500
			0
<b>Totals</b>		<b>1,400.0</b>	<b>3,500.0</b>

DAILY MISC. PRODUCTION	Sand Bedding Volume (3)	Milking Parlor (4)	Recycle Flush Water (4)
	Production (cu.ft./day)	Production (cu.ft./day)	Production (cu.ft./day)
Dairy Cattle	980	490.0	0.0
<b>Totals</b>	<b>980</b>	<b>490.0</b>	<b>0.0</b>

Concrete Pad Runoff Volume Calculations	
Surface Area @ Top ft*2	82,720.00
Annual Precipitation (in.) (5)	20.5
Annual Precipitation Volume (ft*3)	141,313
Surface Area @ Freeboard ft*2	0.00
Annual Evaporation (in.) (5)	0.00
Annual Evaporation Volume (ft*3)	0
Precip/Evap (ft*3)	141,313
Precip/Evap (gal)	1,057,094
25 Year/24 Hour Rain Event (in) (5)	5.6
25 Year/24 Hour Rain Event (ft*3)	38,603
25 Year/24 Hour Rain Event (gal.)	288,767

Earthen Storage Basin Volume Calculations	
Earthen Basin - Dimensions Vary - See Plot Plan	
Surface Area - @ top (ft*2)	250,000
Surface Area - @ freeboard (ft*2)	232,000
Volume (ft*3) - @ freeboard	2,908,000
Volume (gal.) - @ freeboard	21,753,352

Waste Storage Volume Calculations	
Earthen Basin - Dimensions Vary - See Plot Plan	
Annual Precipitation (in.) (5)	35.00
Annual Precipitation Volume (ft*3)	729,167
Annual Evaporation (in.) (5)	32.60
Annual Evaporation Volume (ft*3)	630,267
Precip/Evap (ft*3)	98,900
Precip/Evap (gal)	739,821
25 Year/24 Hour Rain Event (in) (5)	5.6
25 Year/24 Hour Rain Event (ft*3)	102,000
25 Year/24 Hour Rain Event (gal.)	763,011

Earthen Storage Basin - Annual Production Calculation			
Annual Volume Produced	Daily Volume (cu.ft.)	Period (days)	Total Volume (cu.ft.)
Manure Storage Volume	4,970.0	365	1,814,050
		Annual Precipitation vs. Evaporation (9)	380,816
		Annual Production Volume (cu.ft.)	<b>2,194,866</b>
		Annual Production Volume (gal.) (6)	16,418,739.0

Earthen Storage Basin			
Required Volume	Daily Volume (cu.ft.)	Period (days)	Total Volume (cu.ft.)
Manure Storage Volume	4,970.0	150	745,500
		Annual Precipitation vs. Evaporation	240,213
		25 Year/24 Hour Rain Event	140,603
		Required Volume (cu.ft.)	<b>984,820</b>
		Required Volume (gal.) (7)	7,366,969.3
		Actual Facility Storage Volume (gal.) (8)	21,753,352.2

DESIGN FACTORS	
Storage Length - Required (days)	150
Storage Length - "As Built" (days)	484

1 - Average Animal Weight obtained from Livestock Waste Facilities Handbook, Third Edition, MWPS-18 Table 2-1

2 - Manure Storage Volume = # of head x ft\*3/day total manure production livestock Waste Facilities Handbook, Third Edition, MWPS-18 Table 2-1

3 - Bedding Volume = Average Total Animal Weight at any time divided by 1,000 x Bedding Value.

— Sand Bedding Value of 0.5 cu.ft./day/1,000 lbs obtained from Dairy Free stall Housing and Equipment, 6th Edition, 1997 (MWPS-7), Tables 8-4 for Free stall bedding.

4 - Parlor & Flush Water Volume = Based on producer estimate; flush water will be recycled from proposed earthen storage basin.

5 - Precipitation and evaporation data obtained from ISWS Bulletin 70-1989; AWMFH 10C-27 and if applicable, runoff from earthen and surfaced feedlots from USDA SCS AWMFH Figures 10C-1 & 10-C2.

- Annual Runoff from earthen feedlots = N/A of annual precipitation.

- Annual Runoff from paved feedlots = 58.5% of annual precipitation.

6 - Annual Production Volume estimates animal waste and misc. facility production, all precipitation (including 25 year/24 hour rain event) & evaporation volumes over 365 days.

7 - Required Volume includes 25 year/24 hour rain event & precipitation/evaporation volumes.

8 - Actual Volume at Freeboard Elevations (two feet set aside for freeboard requirement).

9 - Annual Precipitation vs Evaporation includes annual precipitation for both the concrete pad and earthen storage as well as the 25 year/24 hour storm totals for both structures.

# EMERGENCY ACTION PLAN

## Contact Names & Numbers - Human Injury

➤ Facility Name: Rancho Cantera LLC

➤ Facility Owner Info:

Name: (b) (6)

Number

➤ Facility Address (911):

2866 N. Sunnyside Road, Kent, IL 61044

➤ Livestock Manager Info:

- If different from owner

Name: (b) (6)

Phone

➤ Specific Directions to the Facility:

From : Hwy 20

South on Sunnyside Rd. to the dairy.

➤ Ambulance

Phone: 911

➤ Doctor or Physician

Name: FHN

Phone: 815/369-3300

➤ Hospital or Medical Clinic

Name: FHN

Phone: 815/369-3300

➤ Fire Department

Phone: 911

➤ County Sheriff

Name: Stephenson County

Phone: 815/235-8252

➤ Illinois Poison Center

Phone: 1-800-222-1222

➤ Other

Name:

Phone:



# EMERGENCY ACTION PLAN

## Actions, Contact Names & Numbers - Manure Release or Spill

1. **Eliminate Source of Release/Spill.**
  - a. Stop the manure application or pumps
  - b. Repair defective component of earthen basin/lagoon and fill with compacted clay
2. **Contain the Release/Spill**
  - a. If material is in application field construct earthen berms capable of containing release/spill.
  - b. If material has reached roadside ditch, creek or stream, create containment dam in ditch or stream to contain the release/spill.
  - c. Construct a temporary holding basin down-gradient of release/spill. Take precautions to not damage the embankments while creating the temporary basin(s).
  - d. Cap or cover all tile intakes that are within or near site of the release/spill. (Note all covers should be pre-made.)
3. **Report Release/Spill to IEPA (within 24 hours) in the following cases:**
  - a. If more than 25 gallons of livestock waste are released/spilled and unrecovered, or
  - b. If a release/spill of livestock waste reaches waters of the state
4. **Document Records of Release/Spill**
  - a. Note the date and time of the release/spill.
  - b. Note the amount of livestock waste associated with the release/spill.
  - c. Note the amount of livestock waste recovered from the release/spill.
  - d. In the case where the release/spill is collected and land applied, document volumes, rates and locations of land applications.

- **Illinois Environmental Protection Agency – Illinois Emergency Management Agency:**  
24 Hr. Number: 1-800-782-7860  
\_\_\_\_\_  
24 Hr. Number: 217-782-7860  
\_\_\_\_\_

### CONTRACTORS:

- **Earth Moving:**  
Name: Loberg  
\_\_\_\_\_  
Phone: 815/443-2874  
\_\_\_\_\_
- **Local Custom Applicator (*if applicable*):**  
Name: Scott Johnson  
\_\_\_\_\_  
Phone: 815/541-5488  
\_\_\_\_\_
- **Local Custom Applicator (*if applicable*):**  
Name: Jeff Kintzle  
\_\_\_\_\_  
Phone: 563/543-5730  
\_\_\_\_\_
- **Irrigation and/or Pumping Equipment:**  
Name: \_\_\_\_\_  
Phone: \_\_\_\_\_
- **Equipment Contractor:**  
Name: Excel Dairy  
\_\_\_\_\_  
Phone: 815/563-4703  
\_\_\_\_\_

*Post by all facility telephones for reference.*

# EMERGENCY ACTION PLAN

## Actions, Contact Names & Numbers - Partial System Failure

- Electric Co.:  
Name: Com Ed

Phone: 800/334-7661

- Electrician:  
Name: Thomason Electric

Phone: 815/369-2221

- LP/Natural Gas:  
Name: Nicor Gas

Phone: 888/642-6748

- Plumbing:  
Name: Molitor Plumbing

Phone: 815/745-2613

- Ventilation:  
Name: Excel Dairy Systems

Phone: 815/563-4703

- Heating:  
Name: Molitor Plumbing

Phone: 815/563-4703

- Feed:  
Name: Eastland Feed

Phone: 815/864-2152

- Veterinarian:  
Name: Lena Vet Clinic

Phone: 815/369-2400

- Mortality Disposal:  
Name: National By Products

Phone: 800/892-5177

- Insurance Carrier:  
Name: (b) (6)

Phone: [REDACTED]

- IL Dept of Ag, Bureau of Animal Health  
24/7 #:  
Phone: 217-782-4944

### CATASTROPHIC DEATH LOSS

1. Contact renderer
  - a. Arrange for pickup of deads
  - b. Make sure that employees & cleanup use appropriate health protections (masks, etc.)
2. Contact your local vet
3. Be in contact with the State Dept. of Agriculture Bureau of Animal Health as needed. (24/7 # provided)

*Post by all facility telephones for reference.*

## ***What to Do if There is a Spill***

Recognize and make an initial assessment of the spill then take quick and effective actions to minimize damage. Many operations will need assistance from other nearby producers and others to handle the situation effectively. It is crucial that prior arrangement be made so that every person involved will know what to do when an emergency situation arises.

### **1. Eliminate Source of Release/Spill.**

- a. Stop the manure application or pumps
- b. Repair defective component of earthen basin/lagoon and fill with compacted clay

### **2. Contain the Release/Spill**

- a. If material is in application field construct earthen berms capable of containing release/spill.
- b. If material has reached roadside ditch, creek or stream, create containment dam in ditch or stream to contain the release/spill.
- c. Construct a temporary holding basin down-gradient of release/spill. Take precautions to not damage the embankments while creating the temporary basin(s).
- d. Cap or cover all tile intakes that are within or near site of the release/spill. (Note all covers should be pre-made.)

### **3. Recover Spilled Material**

- a. Once material is contained recover the material as quickly as possible.
- b. Liquids can be either pumped to a storage structure, or applied at agronomic rates to fields.
- c. When another material such as soil or sawdust is used to create a dam or absorb liquid waste, it is important to properly dispose of all affected material. Land application is an acceptable method of disposing of the soil affected by the spill.
- d. All land applications should be made at agronomic rates. Application rates found within the CNMP can be used as a guide to application.
- e. Questions concerning applications rates can be directed to authors of the plan.
- f. Restore the area to condition prior to release.

### **4. Report Release/Spill to IEPA (within 24 hours) in the following cases:**

- a. If more than 25 gallons of livestock waste are released/spilled and un-recovered,  
or
- b. If a release/spill of livestock waste reaches waters of the state

### **5. Document Records of Release/Spill**

- a. Note the date and time of the release/spill.
- b. Note the amount of livestock waste associated with the release/spill.
- c. Note the amount of livestock waste recovered from the release/spill.
- d. In the case where the release/spill is collected and land applied, document volumes, rates and locations of land applications.

# Spill Response Plan

- 1) Stop the spill immediately!!! Do whatever is necessary or available to use to stop the further flow of effluent as soon as possible.
- 2) Major effort should then be directed to containing the effluent, especially keeping it from entering surface water or other environmentally sensitive areas. Creating an effluent "pond" in a field can be a good thing.
- 3) Assess the extent of the spill and note any obvious damages.  
  
Did the waste reach any surface waters?  
Approximately how much was released and for what duration?  
Any damage noted, such as employee injury, fish kills, or property damage?
- 4) Contact appropriate agencies.

In Illinois, the Illinois Emergency Management Agency is the contact if the spill leaves your property or enters waters of the state.

**IEMA Phone in Illinois call (800) 782-7860. Outside of Illinois call (217) 782-7860 - 24 hours per day, seven days a week.**

Contact your IL EPA Regional Ag Engineer:

Name \_\_\_\_\_ Phone \_\_\_\_\_

IEMA will notify the Illinois Environmental Protection Agency and the Illinois Department of Agriculture. Your phone call should be made within 24 hours **(immediately if to waters of the State)** and include:

- your name
- facility name
- telephone number
- the details of the incident (realistic # of gallons involved)
- the exact location of the facility and or spill
- the location or direction of movement of the spill
- weather and wind conditions (i.e. rain forecast, pre-spill and post-spill)
- what corrective measures have been taken
- and the seriousness of the situation (threat to surface or ground water, spill under control, need for assistance).

For other contacts see the Emergency Phone Number list.

5) **Start cleanup activities, even if state or federal agency staff has not arrived on the scene. DO NOT WAIT!!!**

- As soon as possible begin clean-up procedures
- Notify agencies and local authorities including the local county public health department and appropriate public/private water supplies.
- Attempt application of spilled wastes on cropland
- Assess environmental impact of fish kill, surface water pollution, well or groundwater impact, and amount of waste released and for what duration.

6) A written report (form optional) to the Illinois EPA confirming information provided by telephone is required within 5 days after discovery of the release.

Send Written Reports to:  
Illinois EPA Bureau of Water, Compliance Assurance Section  
P.O. Box 19276 Springfield, IL 62794-9276  
Send Faxes to: (217) 557-1407

All responses to emergencies should be documented and kept with the manure management plan as required in the Livestock Facilities Management Act and Illinois EPA NPDES General Permit. This documentation should include all agency and local authority contacts made during the response phase. This information can be used to assess response to the emergency, prepare for future problems, and train employees.

7) Implement procedures to prevent similar occurrences. Seek professional assistance if problem is berm or structure related.

The State of Illinois requires an owner or operator of a livestock waste handling facility to report any release of 25 gallons or more of livestock waste within 24 hours after discovery of the release into the environment. This reporting requirement includes releases from livestock waste handling facilities and releases from the transportation of livestock waste.

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Releases of any quantity that enter surface waters (including releases to sinkholes, drain inlets, broken subsurface drains or other conduits to groundwater or surface water) must be reported immediately, except when immediate notification would impede the owner's or operator's efforts to correct the cause of the release or contain the livestock waste. In such cases, the report must be made as soon as possible but no later than 24 hours after discovery. In addition to the reporting requirement, the owner or operator is responsible for correcting the cause of the release as soon as possible in order to minimize environmental damage.

The reporting requirement applies to waste storage, handling facilities, piping, pumps, and transportation equipment. Reporting is not required for releases of less than 25 gallons provided no quantity is released to waters of the state or from a controlled and recovered release during field application. A release does not include the normal application of livestock waste to cropland at established agronomic rates.

Failure to report a release could result in fines of up to \$1,000 for the first violation, \$2,500 for a second violation, and up to \$5,000 for a third or subsequent violations. Any environmental damage resulting from the release (such as a fish kill) may subject the owner or operator to additional fines and require him/her to reimburse the state for the value of the damage.

Inquiries concerning the release reporting requirements may be directed to:  
**Illinois EPA, Bureau of Water, Field Operations Section, (217) 782-3362.**

**Nutrient Production**  
**Rancho Cantera LLC**

Nutrient Production Per 1,000 Gal							
Type of animal	Gallons Produced *	Total N	P2O5	K2O	Total N Produced Per Year	Total P2O5 Produced Per Year	Total K2O Produced Per Year
Holding Pond	16,418,739	18.37	8.89	13.05	301,599	146,021	214,254
<b>Whole Farm</b>					<b>301,599</b>	<b>146,021</b>	<b>214,254</b>

\* From Waste volume calculation page

**Crop Nutrient Need**  
Per Acre

Crop	Yield	N lbs/ac	P2O5 lbs/ac	K2O lbs/ac	Acres needed based on N produced**	Acres needed based on P2O5 produced***
Corn (continuous)	195.0	197	84	54	1531	1,738
Corn (bean rotation)	195.0	153	84	54	1971	1,738
Beans	50.0	0	42	65	n/a	3,477
Wheat	60.0	60	54	18	5027	2,704
Alfalfa Hay	4.0	0	48	200	n/a	3,042
Grass	3.0	150	36	150	2011	4,056

\*\*Total N produced/N needed per acre

\*\*\*Total P produced/P needed per acre

Current crop rotation			
Crop	Acres	N needed	P2O5 needed
Corn (continuous)	1,423	280,282	119,511
Corn (bean rotation)	0	0	0
Beans	0	0	0
Wheat	0	0	0
Alfalfa Hay	0	0	0
Grass	0	0	0
<b>Total</b>	<b>1,423</b>	<b>280,282</b>	<b>119,511</b>

Calculations do not take into account nutrient losses from application of waste.

## ***Facility Operation and Management***

1. Check backfill areas around facilities often for excessive settlement.  
Determine if settlement is caused by consolidation, piping or failure of the structure walls or floor. Necessary repairs must be made. Refer to safety items.
2. Check walls and floor often for cracks and/or separations and make needed repairs. Check earth berms and embankments for sloughing, erosion or settlement. Maintain embankment and backfill elevations as specified in the design. Check a minimum of two times a year and when the facility is empty. Maintain design elevation of berms and fill.
3. Outlets of foundation drains should be checked frequently and kept open. The outflow from these drains should be checked periodically when the storage facility is being used to determine if there is leakage from the facility into these drains. Leakage may be detected by the color and smell of the outflowing liquid, by lush dark green growth of vegetation around the outlet, by the growth of algae in the surface ditch or by the vegetation being killed by the outflowing liquid. If leakage is detected, repairs should be planned and made to prevent the possible contamination of groundwater. Refer to safety items when planning and making repairs. Quarterly samples should be collected from foundation drains as required by the Livestock Management Facilities Act.
4. Divert surface water away from the storage facility. Check the channels and berms of the clean water diversions around the barnyard, buildings and storage facility frequently. Channels must be protected from erosion and berms must be maintained at proper height so the diversion channels have adequate capacity. These channels and berms should not be used as haul roads unless they were designed and constructed as haul roads.
5. Check frequently for burrowing animals around buildings, structures, berms and backfill. Remove them and repair any damage.
6. Inspect haul roads and approaches to and from the storage facility frequently to determine the need for stone, gravel or other stabilizing material.
7. Do not allow runoff from loading areas and/or spills to flow into streams or road ditches.



8. Install and maintain a marking or gauge post that clearly shows the design, one-half, and full levels of the facility.

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9. Repair or replace any rusted or damaged metal and paint.
10. A good vegetative cover of recommended grasses should be maintained on earth berms and embankments. If the vegetative cover is damaged, it should be reseeded as soon as possible. The vegetative cover should be mowed at least twice a year to control weeds, encourage vigorous growth and discourage rodent activity.
11. Immediately repair any vandalism, vehicular or livestock damage to the facility, the surrounding area, or any appurtenances.
12. Pump-out shall commence when the deep pit facilities are approximately 1' from the bottom of the slats and should continue until the depth is reduced to approximately 1'.

## ***Earthen Storage/Lagoon – Operation & Maintenance***

1. Earthen slopes shall be checked for rills and gullies. Seeding shall be as necessary to maintain a grass cover. Weeds shall be controlled. The top of dam and outside slopes shall be mowed annually to discourage weed growth and allow closer examination of the earth embankment. Quickly remove woody vegetation that begins to grow on the embankment to prevent root establishment.
2. Earthen slopes shall be checked for soft or damp/wet areas that may be a sign of potential leakage. Burrowing animals in the slopes shall be controlled. Animals shall be immediately removed and the burrow holes filled.
3. Fencing/gates shall be maintained around the structure to exclude animals and humans at all times.
4. Safety equipment (life buoys, ropes) and warning signs shall be maintained and checked periodically for wear.
5. High traffic areas, such as pump access areas, should be lined with aggregate or concrete if vegetative cover cannot be maintained.
6. Where dedicated agitation areas are established, inspect the bottom for scour holes. Where holes develop, fill with compacted clay, and line the surface with concrete to prevent further scouring. If this does occur, please contact the local NRCS office or a licensed professional engineer for assistance.
7. The maximum operating level in the facility is 2 feet below the low point in the existing embankment that contains the manure and runoff. When this elevation is reached, pump-out should commence as long as soil conditions exist that will allow for infiltration of the manure liquids. Pump-out is not to occur in December, January, or February. Pump-out should not be scheduled if severe or wet weather is a threat. The elevation at which pump-out is to occur shall be marked with a post or other suitable device.
8. If possible, thoroughly agitate the storage facility one hour before pump-out and during pump-out to ensure uniform distribution of nutrients in manure.
9. Domestic and industrial waste from toilets shall not be discharged into the storage facility (s).
10. In the event of closure or shutdown, where there is no longer a need to manage manure and runoff from this operation, follow a closure plan according to state regulations. Contact the local NRCS office or a licensed professional engineer for assistance.

## ***Nutrient Application Equipment Calibration***

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### **Commercial Fertilizer Application Equipment Calibration:**

The nitrogen applicator, the commercial broadcast spreaders, and corn planter will be set per the manufacturers recommendations then filled with a known amount and checked over known acreage. Adjustments will be made to achieve the planned rates.

### **Manure Spreader/Tanker Calibration**

There are several methods that can be used to calibrate the application rate of a manure spreader. The two best methods are the load-area method and the plastic sheet method. It is desirable to repeat the calibration procedure 2 to 3 times and average the results to establish a more accurate calibration.

Before calibrating a manure spreader, the spreader settings such as splash plates should be adjusted so that the spread is uniform. Most spreaders tend to deposit more manure near the spreader than at the edge of the spread pattern. Overlapping can make the overall application more uniform. Calibrating application rates when overlapping is involved requires measuring the width of two spreads and dividing by two to get the effective spread width.

Calibration should take place annually or whenever manure is being applied from a different source or consistency.

### **Load-Area Method**

The load-area method is the most accurate and can be used for most types of manure handling. This method consists of determining the amount (volume or weight) of manure in a spreader and the total area over which it is applied. The most accurate method to determine the amount of manure in a spreader is to weigh the spreader when it is full of manure and again when it is empty (portable pad scales work well for this). The difference is the quantity of manure applied over the area covered. Spreader capacities listed by the manufacturers can be used to determine the amount of manure in the spreader. However care must be taken when using manufactures spreader capacities. Heaped loads, loading methods and manure type may vary considerably from what is listed by manufacturers of box and side delivery manure spreaders. Spreader capacities for liquid tankers are accurate provided the tanker is filled to the manufactures recommended levels, and no foam is present in the tank.

The area of spread is determined from measuring the length and width of the spread pattern. Measuring can be done with a measuring wheel, measuring tape or by pacing.

The application rate is calculated using the following formula:

$$\frac{\text{Spreader capacity (tons or gallons)} \times 43560 \text{ sq. ft/acre}}{\text{Gallons/Acre Distance traveled} \times \text{Spreading width}} = \text{Application Rate tons or Gallons/Acre}$$

---

### **Plastic Sheet Method**

The plastic sheet method can only be used with solid or semi-solid manure. This method of calibrating spreader application rates involves 1) cutting a plastic sheet to the specified dimensions (56 inches X 56 inches), 2) weighing the clean plastic sheet, 3) laying out the plastic sheet on the ground and driving the manure spreader (applying manure at a recorded speed and spreader setting) over the sheet, 4) weighing the plastic sheet with the manure on it, and 5) determine the net weight of the manure on the sheet (weight of manure and sheet - weight of the clean sheet), and 6) the net pounds of manure equals tons per acre applied.

When calibrating manure spreaders, all details regarding tractor speed and manure spreader settings and date(s) of each calibration should be recorded with manure application information, and directly on the equipment. Mark equipment to ensure a known application rate is applied each time the referenced tractor speed and spreader settings are used. Manure spreader settings can include such things as: fast and slow settings on some box spreaders, gate position on side delivery spreaders and splash plate position and fill levels on liquid tankers.

## ***Facility Safety Recommendations***

1. Waste storage facilities must be considered "High Hazard Areas". The biodegradation of waste forms noxious gases such as methane (CH<sub>4</sub>), Hydrogen sulfide (H<sub>2</sub>S), ammonia (NH<sub>3</sub>) and carbon dioxide (CO<sub>2</sub>). This can be fatal to both animals and human beings.

■ **HYDROGEN SULFIDE PARALYZES THE DIAPHRAGM AND THE VICTIM WILL NOT START BREATHING AGAIN WITHOUT ARTIFICIAL RESPIRATION, EVEN AFTER BEING REMOVED FROM THE NOXIOUS GASSES.**

2. Some of these gases can be explosive with the proper gas to air ratio. Use caution with open flames, welding torches and arcs, electrical motors with brushes that spark (skillsaws, electric drills, shop vacs, etc.) when working near waste storage facilities. Be sure the work area is well ventilated.
3. Agitation of liquid manure can release large volumes of these noxious gases. Special care must be taken to provide adequate ventilation during agitation and emptying of the storage facility. If there is a question regarding the adequacy of ventilation, the livestock should be evacuated from the building and the operator should wear an oxygen mask.
4. Operators should avoid working alone during agitating and emptying the facility.
5. A reception pit, tank or other storage facility that has contained liquid/slurry manure should not be entered because gases may remain in the structure. When it is necessary for someone to enter one of the structures for repairs, the following precautions must be taken:
  - a. The reception pit shall be ventilated by the use of fans, blowers, etc.
  - b. There should be at least two people; one to remain on the outside and one to enter the facility.
  - c. The one entering the structure must have a safety line attached so that the "outside" person can pull the victim to safety without entering the facility.
  - d. The one entering must have an air mask, which furnishes outside air through an airline and compressor, scuba equipment with air tanks or other means of positively furnished outside air.

- e. Gas masks must not be used because they operate on the principle of chemically removing unwanted gases from air so the wearer can breathe safely. In manure facilities, the air has been displaced by the noxious gases and when the gases are removed by the gas mask, the wearer will suffocate because there is no air to breathe.
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- 6. All lids, gates, hatch covers, shields and safety grates to prevent unauthorized entry by people or livestock must be securely in place when tanks and pit openings are left unattended and must be repaired immediately when damaged.
  - 7. Never leave a ladder that stands against an above ground waste storage facility unattended.
  - 8. All waste storage facilities must be posted with signs with the following or similar warning:

**DANGER - KEEP OUT**

**THIS IS A WASTE STORAGE FACILITY AND PROLONGED  
EXPOSURE MAY BE HAZARDOUS TO YOUR HEALTH.**

- 9. Inspect and repair/replace, as needed, all warning and hazard signs.



## ***Odor and Pathogen Management***

It may not be practical or feasible to eliminate all odor emissions from the operation, but it is possible to manage or mitigate the odor. Some variables that affect odor are:

- Type of operation
- Ventilation method
- Animal diets
- Season
- Management skill or effort
- Building design
- Animal numbers
- Manure treatment system
- Topography

### **1. Animal Cleanliness**

- a. Clean, dry, and healthy animals are less odorous. Dirty, manure-covered animals promote accelerated bacterial growth and the production of odorous gases.
- b. Animal stress can also be correlated to an increase in odor production. Ventilation and environmental controls for the buildings must be properly designed and maintained to keep the animals healthy.

### **2. Minimize Dust**

- a. It has been established that there is a correlation between dust and odor emission. Dust particles adsorb and concentrate odorous compounds. As the dust particles are carried by the wind, so is the odor.
- b. Therefore, minimizing dust will reduce odor. Most farm dust comes from feed, fecal matter and, in the case of poultry, from feathers and litter. Dust also comes from animal skin, insects, and other sources.
- c. Buildings should be cleaned of all dust between batches of animals (including fans, shutters, and screens).

### **3. Waste Storage Facility**

To reduce emissions of greenhouse gases, ammonia, volatile organic compounds, and odor:

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- If odors from the facility become a concern, consideration can be given to alternatives and additional practices including but not limited to covered anaerobic digesters, and composting facilities.
- Adjusting pH below 7 may reduce ammonia emissions from the waste storage facility but may increase odor when waste is surface applied.
- Consideration should also be given to the separation of the solids from the waste mixture. This will dilute the liquid waste product being treated in the lagoon and cause less odor. The solid separated material can be composted and sold or land applied.

### **4. Animal diets**

Diets can also be manipulated to produce less manure production and odors from the manure. Much of the odors from manure are from nitrogen, sulfur and carbohydrate containing volatile compounds. Balancing the diet with the proper amounts and forms of protein and reducing excess protein in the diet will reduce nitrogen excretion and odor emissions from the manure.

### **5. Proper Disposal of Mortality**

Normal mortality for the animal feeding operation must be properly handled for both odor control and biological security of the operation. Composting, incineration, and rendering are acceptable methods for mortality disposal.

### **6. Good Fly and Rodent Control Programs**

These programs must be a continuous process on the farm. When feed and waste products are properly handled, these problems are minimized. Fly and rodent bait stations and/or boxes should also be utilized to control populations. Check all bait stations regularly and replace when necessary.

## **Manure Sampling**

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### **1. Collecting the Sample**

When collecting a manure sample from a storage facility, the most important thing to keep in mind is to collect a sample representative of what will be land applied to the crop. If a livestock operation has more than one storage facility (e.g., a holding pond and a drystack) each unit should be sampled separately (e.g., the producer will need to collect two samples, one to represent each manure type, liquid sample, and a solid sample).

### **2. Pit Storage Structures (Below Building) Above Ground Storage Structures (Slurrystore)**

Manure samples can be samples prior to applications, after the structure has been agitated to assure a homogenous sample. If agitation cannot be performed, because of gas production and animal welfare, a sample can be obtained from the application equipment or the outlet line on the pump. Three to six samples should be collected from different loads and mixed together to form one composite sample. If it is not possible to collect a sample from the previous two methods, samples should be collected directly from the structure. A sample should be collected at the top, middle, and bottom of the land application event. A one-pint sample is usually sufficient to be sent to the lab, provided that it is in well-sealed container. A wide mouthed plastic bottle works well. Consult with the lab directly for specific instructions.

### **3. Drystacks**

The sample sent to the lab from a drystack should be a composite of several sub-samples. Sub-samples should be obtained from about 10 locations within the drystack. The sample locations should vary by depth (from 1 ft. deep to 3 inches from the bottom) and by position (from the front, back, and sides). After collecting the sub-samples, the material should be mixed in one container to make a homogeneous composite sample. The composite sample sent to the lab should be about one pint. It should be sent in a well-sealed container. Sealable plastic bags work well for relatively dry material, wide mouthed plastic bottles are better for wetter material.

#### **4. Earthen Storages/Holding Ponds**

Storages should be sampled immediately before or during land application. The condition of the storage during sample collection should reflect the condition of the storage during land application. If the storage is agitated during land application and is well mixed, one sample will be representative of the entire facility. The agitation time required for the storage facility to become well mixed is dependent on its size and shape and the agitation equipment. Small facilities are usually well agitated after one to two hours. If the facility is not agitated during land application, it will not be well mixed. In this case three samples should be collected; a sample should be collected at the beginning, middle, and end of the land application event. Storage facility samples can be collected from the storage itself, the outlet line on the pump or from the application equipment. A one-pint sample is usually sufficient to be sent to the lab, provided that it is in well-sealed container. A wide mouthed plastic bottled works well. Consult with the lab directly for specific instructions.

#### **5. Lagoons**

Anaerobic lagoons should be sampled immediately before or during land application. The condition of the lagoon during sample collection should reflect the condition of the lagoon during land application. A minimum of three samples should be collected; a sample should be collected at the beginning, middle, and end of the land application event. Lagoon samples can be collected from the lagoon itself, the outlet line on the pump or from the application equipment. A one-pint sample is usually sufficient to be sent to the lab, provided that it is in well-sealed container. A wide mouthed plastic bottle works well. Consult with the lab directly for specific instructions.

#### **6. Sample Transfer**

The sample should be mailed or delivered to the lab the day of collection to reduce sample degradation with time. Do not send samples that will not be delivered within one to two business days. For example, do not send on a Thursday and allow it to set in the post office or mail box during a weekend. The sample should be analyzed for total nitrogen, ammonia nitrogen, phosphorus, potassium and total solids. Contact the lab prior to sending in a sample to receive a sample analysis form to mail in with your sample.

## ***Soil Testing Procedures***

Soil samples for soil tests should not represent more than 2.5 acres per sample and should be done at least every 3-4 years. Any field not sampled at 2.5 acre frequency should be re-sampled at 2.5 acre grids on the next scheduled soil testing cycle.

Soil sampling depth for P and K shall be 7 inches. Under no-till conditions pH can be tested using the top 4 inches only.

Soil samples shall be collected and prepared according to The Illinois Agronomy Handbook. Soil samples should be taken prior to manure or fertilizer applications. Since manure will typically be applied to soybean stubble during the fall previous to planting corn in the spring, soil tests should be taken in soybean stubble prior to manure application. Wait 9 months after manure or fertilizer applications before soil testing so that unabsorbed nutrients do not affect the results.

*The minimum soil analysis for CNMP's should include the following parameters:*

- *soil pH,*
- *phosphorus (P as indicated by Bray P1 test)*
- *potassium, (K)*

In addition, Cation Exchange Capacity (CEC), and soil organic matter should be tested to help determine liming and fertilizer recommendations. Soil testing should include analysis for any nutrients for which specific information is needed to develop the nutrient plan.

Soil sample lab reports are filed under each field's individual information.

## ***Future Wells***

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When installing new wells, springs or other potable water sources, due consideration must be given to the distance, grade and location of the waste storage facility to the new water source. The Department of Health, Department of Agriculture and/or Natural Resources Conservation Service should be consulted as to installing new potable water supplies in relation to the waste storage facility.



## LAND TREATMENT PRACTICES

### Land Treatment Practices Overview

Land treatment practices are to be applied to fields to limit the potential for runoff or other hazardous incidents from occurring due to land application of manure. As part of this element of the CNMP, the RUSLE2 program was run for each of the fields indicated in the plan. The results of RUSLE2 are outlined in the following RUSLE2 reports.

### Current Management Practices for Fields in CNMP

The cropland utilized in this CNMP will be in a continuous corn rotation. Continuous corn fields are chisel plowed in the fall. Fields are field cultivated in the spring prior to planting corn on 30" rows. All fields were run using RUSLE2 as outlined below. More comprehensive RUSLE2 reports can also be found in the printed reports on the following pages.

Field Name	Soil Type	Crop	Yield Goal Bu/Acre	Soil Loss T	RUSLE 2 Soil Loss
R/C 116	675B Greenbush silt loam	Continuous Corn	200	5.0	1.4
R/C 19.1	280C2 Fayette silt loam	Continuous Corn	200	5.0	2.4
R/C 40	735D2 Casco Rodman Fox Complex	Continuous Corn	200	3.0	2.2
R/C 8.1	280C2 Fayette silt loam	Continuous Corn	200	5.0	2.4
R/C 2.5	8451A Lawosn silt loam	Continuous Corn	200	5.0	0.4
R/C 24.2	280C2 Fayette silt loam	Continuous Corn	200	5.0	2.4
R/C 4.9	429C2 Palsgrove silt loam	Continuous Corn	200	3.0	2.4
(b) (6)	675B Greenbush silt loam	Continuous Corn	200	5.0	1.4
	280C2 Fayette silt loam	Continuous Corn	200	5.0	2.4
	280C2 Fayette silt loam	Continuous Corn	200	5.0	2.4
	280C2 Fayette silt loam	Continuous Corn	200	5.0	2.4
	280C2 Fayette silt loam	Continuous Corn	200	5.0	2.4
	8451A Lawosn silt loam	Continuous Corn	200	5.0	0.4
	280C2 Fayette silt loam	Continuous Corn	200	5.0	2.4
	279B Rozetta silt loam	Continuous Corn	200	5.0	1.7
	675C2 Greenbush silt loam	Continuous Corn	200	5.0	3.1
	675B Greenbush silt loam	Continuous Corn	200	5.0	1.4
	675C2 Greenbush silt loam	Continuous Corn	200	5.0	3.1
	8451A Lawosn silt loam	Continuous Corn	200	5.0	0.4
	279B Rozetta silt loam	Continuous Corn	200	5.0	1.7
	419C2 Flagg silt loam	Continuous Corn	200	5.0	3.6
	419C2 Flagg silt loam	Continuous Corn	200	5.0	3.6
	419C2 Flagg silt loam	Continuous Corn	200	5.0	3.6
	279B Rozetta silt loam	Continuous Corn	200	5.0	1.7
	61B Atterberry silt loam	Continuous Corn	200	5.0	1.4
	279B Rozetta silt loam	Continuous Corn	200	5.0	1.7

All fields meet T with current and planned management & rotations.

## Land Treatment Practices Current & Planned

Nutrient Management – Code 590 – Animal manures and commercial fertilizer will be applied to land to help meet crop nutrient needs. Soil testing, manure analysis, and record keeping will be performed. *(current & planned- All Fields)*

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Waste Utilization – Code 633 - Animal manures will be applied to land in an environmentally acceptable manner to maintain or improve soil, air, water, and plant resources. *(current & planned – All Fields)*

Manure Transfer – Code 634 – Manure will be conveyed using structures, conduit, or equipment in order to transfer manure through a hopper, reception pit, pump, conduit, or hauling equipment to a manure storage facility, loading area, or to agricultural land for final utilization. *(current –& planned – Liquid application via broadcast)*

Grass Waterway – Code 412 – A natural or constructed channel that is shaped and graded to required dimensions and established with suitable vegetation to convey runoff from terraces, diversions, or other water concentrations without causing erosion or flooding, to reduce gully erosion, or to protect and/or improve water quality in areas where added water conveyance capacity and vegetative protection are needed to control erosion resulting from concentrated runoff. *(current –R/C 116, R/C 40, Wenzel 80 South, Todd S 76.1, Todd S 56.4, R/C 135.3; none planned)*



## RUSLE2 Profile Erosion Calculation Record

**Fields:** (b) (6) 160

**File:** Plan: Profile (Temp. scenario[1]) of Rancho Cantera\*

**Access Group:** R2\_NRCS\_Fld\_Office

**Inputs:**

Location: Illinois\Stephenson County

Soil: 61B Atterberry silt loam, 2 to 5 percent slopes\Atterberry silt loam 98&per;

Slope length (horiz): 150 ft

Avg. slope steepness: 3.5 %

Management	Vegetation	Yield units	Yield (# of units)
CMZ 17c.Other Local Mgt Records\RC Cont Corn	Corn, grain	bushels	195.00

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Subsurface drainage: (none)

Adjust res. burial level: bury 20% more than normal

General yield level: Set by user

Rock cover: 0 %

**Outputs:**

T value: 5.0 t/ac/yr

Soil loss erod. portion: 1.4 t/ac/yr

Detachment on slope: 1.4 t/ac/yr

Soil loss for cons. plan: 1.4 t/ac/yr

Sediment delivery: 1.4 t/ac/yr

Net C factor: 0.058

Net K factor: 0.36

Crit. slope length: -- ft

Surf. cover after planting: 32 %

Date	Operation	Vegetation	Surf. res. cov. after op, %
11/10/0	Manure spreader, liquid		84
11/11/0	Chisel plow, disk, st. pts., cover disks		36
4/1/1	Cultivator, field 6-12 in sweeps		37
4/3/1	Planter, double disk opnr w/fluted coulter	Corn, grain	32
10/10/1	Harvest, killing crop 50pct standing stubble		87

Soil conditioning index (SCI): 0.64

Avg. annual slope STIR: 96

Wind & irrigation-induced erosion for SCI: 0 t/ac/yr



## RUSLE2 Profile Erosion Calculation Record

Fields: (b) (6)

**File:** Plan: Profile (Temp. scenario[1]) of Rancho Cantera\*  
**Access Group:** R2\_NRCS\_Fld\_Office

### Inputs:

Location: Illinois\Stephenson County  
Soil: 279B Rozetta silt loam, 2 to 5 percent slopes\Rozetta silt loam 91&per;  
Slope length (horiz): 150 ft  
Avg. slope steepness: 3.5 %

Management	Vegetation	Yield units	Yield (# of units)
CMZ 17\c.Other Local Mgt Records\RC Cont Corn	Corn, grain	bushels	195.00

Contouring: a. rows up-and-down hill  
Strips/barriers: (none)  
Diversion/terrace, sediment basin: (none)  
Subsurface drainage: (none)  
Adjust res. burial level: bury 20% more than normal  
General yield level: Set by user  
Rock cover: 0 %

### Outputs:

T value: 5.0 t/ac/yr  
Soil loss erod. portion: 1.7 t/ac/yr  
Detachment on slope: 1.7 t/ac/yr  
Soil loss for cons. plan: 1.7 t/ac/yr  
Sediment delivery: 1.7 t/ac/yr  
Net C factor: 0.057  
Net K factor: 0.41

Crit. slope length: -- ft  
Surf. cover after planting: 32 %

Date	Operation	Vegetation	Surf. res. cov. after op, %
11/10/0	Manure spreader, liquid		84
11/11/0	Chisel plow, disk, st. pts., cover disks		36
4/1/1	Cultivator, field 6-12 in sweeps		37
4/3/1	Planter, double disk opnr w/fluted coulter	Corn, grain	32
10/10/1	Harvest, killing crop 50pct standing stubble		87

Soil conditioning index (SCI): 0.62  
Avg. annual slope STIR: 96  
Wind & irrigation-induced erosion for SCI: 0 t/ac/yr



## RUSLE2 Profile Erosion Calculation Record

Fields: R/C 19.1, R/C 8.1, R/C 24.2, (b) [REDACTED]

**File:** Plan: Profile (Temp. scenario[1]) of Rancho Cantera\*

**Access Group:** R2\_NRCS\_Fld\_Office

### Inputs:

Location: Illinois\Stephenson County

Soil: 280C2 Fayette silt loam, 4 to 7 percent slopes, eroded\Fayette silt loam 100%

Slope length (horiz): 150 ft

Avg. slope steepness: 6.0 %

Management	Vegetation	Yield units	Yield (# of units)
CMZ 17\c.Other Local Mgt Records\RC Cont Corn	Corn, grain	bushels	195.00

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Subsurface drainage: (none)

Adjust res. burial level: bury 20% more than normal

General yield level: Set by user

Rock cover: 0 %

### Outputs:

T value: 5.0 t/ac/yr

Soil loss erod. portion: 2.4 t/ac/yr

Detachment on slope: 2.4 t/ac/yr

Soil loss for cons. plan: 2.4 t/ac/yr

Sediment delivery: 2.4 t/ac/yr

Net C factor: 0.057

Net K factor: 0.36

Crit. slope length: -- ft

Surf. cover after planting: 32 %

Date	Operation	Vegetation	Surf. res. cov. after op, %
11/10/0	Manure spreader, liquid		84
11/11/0	Chisel plow, disk, st. pts., cover disks		36
4/1/1	Cultivator, field 6-12 in sweeps		37
4/3/1	Planter, double disk opnr w/fluted coulter	Corn, grain	32
10/10/1	Harvest, killing crop 50pct standing stubble		87

Soil conditioning index (SCI): 0.56

Avg. annual slope STIR: 96

Wind & irrigation-induced erosion for SCI: 0 t/ac/yr



## RUSLE2 Profile Erosion Calculation Record

**Fields:** (b) (6)

**File:** Plan: Profile (Temp. scenario[1]) of Rancho Cantera\*

**Access Group:** R2\_NRCS\_Fld\_Office

### Inputs:

Location: Illinois\Stephenson County

Soil: 419C2 Flagg silt loam, 5 to 10 percent slopes, eroded\Flagg silt loam 95&per;

Slope length (horiz): 150 ft

Avg. slope steepness: 7.5 %

Management	Vegetation	Yield units	Yield (# of units)
CMZ 17\c.Other Local Mgt Records\RC Cont Corn	Corn, grain	bushels	195.00

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Subsurface drainage: (none)

Adjust res. burial level: bury 20% more than normal

General yield level: Set by user

Rock cover: 0 %

### Outputs:

T value: 5.0 t/ac/yr

Soil loss erod. portion: 3.6 t/ac/yr

Detachment on slope: 3.6 t/ac/yr

Soil loss for cons. plan: 3.6 t/ac/yr

Sediment delivery: 3.6 t/ac/yr

Net C factor: 0.055

Net K factor: 0.41

Crit. slope length: -- ft

Surf. cover after planting: 32 %

Date	Operation	Vegetation	Surf. res. cov. after op, %
11/10/0	Manure spreader, liquid		84
11/11/0	Chisel plow, disk, st. pts., cover disks		36
4/1/1	Cultivator, field 6-12 in sweeps		37
4/3/1	Planter, double disk opnr w/fluted coulter	Corn, grain	32
10/10/1	Harvest, killing crop 50pct standing stubble		87

Soil conditioning index (SCI): 0.47

Avg. annual slope STIR: 96

Wind & irrigation-induced erosion for SCI: 0 t/ac/yr





## RUSLE2 Profile Erosion Calculation Record

**Fields:** R/C 4.9

**File:** Plan: Profile (Temp. scenario[1]) of Rancho Cantera\*

**Access Group:** R2\_NRCS\_Fld\_Office

**Inputs:**

Location: Illinois\Stephenson County

Soil: 429C2 Palsgrove silt loam, 5 to 10 percent slopes, eroded\Palsgrove silt loam 90%

Slope length (horiz): 150 ft

Avg. slope steepness: 7.5 %

Management	Vegetation	Yield units	Yield (# of units)
CMZ 17\c.Other Local Mgt Records\RC Cont Corn no fall chisel	Corn, grain	bushels	195.00

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Subsurface drainage: (none)

Adjust res. burial level: bury 20% more than normal

General yield level: Set by user

Rock cover: 0 %

**Outputs:**

T value: 3.0 t/ac/yr

Soil loss erod. portion: 2.4 t/ac/yr

Detachment on slope: 2.4 t/ac/yr

Soil loss for cons. plan: 2.4 t/ac/yr

Sediment delivery: 2.4 t/ac/yr

Net C factor: 0.039

Net K factor: 0.41

Crit. slope length: -- ft

Surf. cover after planting: 68 %

Date	Operation	Vegetation	Surf. res. cov. after op, %
11/10/0	Manure spreader, liquid		87
4/1/1	Cultivator, field 6-12 in sweeps		74
4/3/1	Planter, double disk opnr w/fluted coulter	Corn, grain	68
10/10/1	Harvest, killing crop 50pct standing stubble		90

Soil conditioning index (SCI): 0.86

Avg. annual slope STIR: 29

Wind & irrigation-induced erosion for SCI: 0 t/ac/yr



## RUSLE2 Profile Erosion Calculation Record

Fields: R/C 4.9, (b) (6) 80

**File:** Plan: Profile (Temp. scenario[1]) of Rancho Cantera\*

**Access Group:** R2\_NRCS\_Fld\_Office

**Inputs:**

Location: Illinois\Stephenson County

Soil: 675B Greenbush silt loam, 2 to 5 percent slopes\Greenbush silt loam 95%

Slope length (horiz): 150 ft

Avg. slope steepness: 3.5 %

Management	Vegetation	Yield units	Yield (# of units)
CMZ 17\c.Other Local Mgt Records\RC Cont Corn	Corn, grain	bushels	195.00

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Subsurface drainage: (none)

Adjust res. burial level: bury 20% more than normal

General yield level: Set by user

Rock cover: 0 %

**Outputs:**

T value: 5.0 t/ac/yr

Soil loss erod. portion: 1.4 t/ac/yr

Detachment on slope: 1.4 t/ac/yr

Soil loss for cons. plan: 1.4 t/ac/yr

Sediment delivery: 1.4 t/ac/yr

Net C factor: 0.058

Net K factor: 0.36

Crit. slope length: -- ft

Surf. cover after planting: 32 %

Date	Operation	Vegetation	Surf. res. cov. after op, %
11/10/0	Manure spreader, liquid		84
11/11/0	Chisel plow, disk, st. pts., cover disks		36
4/1/1	Cultivator, field 6-12 in sweeps		37
4/3/1	Planter, double disk opnr w/fluted coulter	Corn, grain	32
10/10/1	Harvest, killing crop 50pct standing stubble		87

Soil conditioning index (SCI): 0.64

Avg. annual slope STIR: 96

Wind & irrigation-induced erosion for SCI: 0 t/ac/yr



## RUSLE2 Profile Erosion Calculation Record

Fields: (b) (6) 20

**File:** Plan: Profile (Temp. scenario[1]) of Rancho Cantera\*

**Access Group:** R2\_NRCS\_Fld\_Office

### Inputs:

Location: Illinois\Stephenson County

Soil: 675C2 Greenbush silt loam, 5 to 10 percent slopes, eroded\Greenbush silt loam 91&per;

Slope length (horiz): 150 ft

Avg. slope steepness: 7.5 %

Management	Vegetation	Yield units	Yield (# of units)
CMZ 17\c.Other Local Mgt Records\RC Cont Corn	Corn, grain	bushels	195.00

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Subsurface drainage: (none)

Adjust res. burial level: bury 20% more than normal

General yield level: Set by user

Rock cover: 0 %

### Outputs:

T value: 5.0 t/ac/yr

Soil loss erod. portion: 3.1 t/ac/yr

Detachment on slope: 3.1 t/ac/yr

Soil loss for cons. plan: 3.1 t/ac/yr

Sediment delivery: 3.1 t/ac/yr

Net C factor: 0.055

Net K factor: 0.36

Crit. slope length: -- ft

Surf. cover after planting: 32 %

Date	Operation	Vegetation	Surf. res. cov. after op, %
11/10/0	Manure spreader, liquid		84
11/11/0	Chisel plow, disk, st. pts., cover disks		36
4/1/1	Cultivator, field 6-12 in sweeps		37
4/3/1	Planter, double disk opnr w/fluted coulter	Corn, grain	32
10/10/1	Harvest, killing crop 50pct standing stubble		87

Soil conditioning index (SCI): 0.51

Avg. annual slope STIR: 96

Wind & irrigation-induced erosion for SCI: 0 t/ac/yr



## RUSLE2 Profile Erosion Calculation Record

**Fields:** R/C 40

**File:** Plan: Profile (Temp. scenario[1]) of Rancho Cantera\*

**Access Group:** R2\_NRCS\_Fld\_Office

**Inputs:**

Location: Illinois\Stephenson County

Soil: 735D2 Casco-Rodman-Fox complex, 6 to 12 percent slopes, eroded\Casco silt loam 35%

Slope length (horiz): 150 ft

Avg. slope steepness: 9.0 %

Management	Vegetation	Yield units	Yield (# of units)
CMZ 17\c.Other Local Mgt Records\RC Cont Corn no fall chisel	Corn, grain	bushels	195.00

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Subsurface drainage: (none)

Adjust res. burial level: bury 20% more than normal

General yield level: Set by user

Rock cover: 0 %

**Outputs:**

T value: 3.0 t/ac/yr

Soil loss erod. portion: 2.2 t/ac/yr

Detachment on slope: 2.2 t/ac/yr

Soil loss for cons. plan: 2.2 t/ac/yr

Sediment delivery: 2.2 t/ac/yr

Net C factor: 0.041

Net K factor: 0.31

Crit. slope length: -- ft

Surf. cover after planting: 68 %

Date	Operation	Vegetation	Surf. res. cov. after op, %
11/10/0	Manure spreader, liquid		87
4/1/1	Cultivator, field 6-12 in sweeps		74
4/3/1	Planter, double disk opnr w/fluted coulter	Corn, grain	68
10/10/1	Harvest, killing crop 50pct standing stubble		90

Soil conditioning index (SCI): 0.87

Avg. annual slope STIR: 29

Wind & irrigation-induced erosion for SCI: 0 t/ac/yr





## RUSLE2 Profile Erosion Calculation Record

Fields: R/C 2.5, (b) 25

**File:** Plan: Profile (Temp. scenario[1]) of Rancho Cantera\*

**Access Group:** R2\_NRCS\_Fld\_Office

### Inputs:

Location: Illinois\Stephenson County

Soil: 8451A Lawson silt loam, 0 to 2 percent slopes, occasionally flooded\Lawson silt loam 90%

Slope length (horiz): 150 ft

Avg. slope steepness: 1.0 %

Management	Vegetation	Yield units	Yield (# of units)
CMZ 17\c.Other Local Mgt Records\RC Cont Corn	Corn, grain	bushels	195.00

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Subsurface drainage: (none)

Adjust res. burial level: bury 20% more than normal

General yield level: Set by user

Rock cover: 0 %

### Outputs:

T value: 5.0 t/ac/yr

Soil loss erod. portion: 0.40 t/ac/yr

Detachment on slope: 0.40 t/ac/yr

Soil loss for cons. plan: 0.40 t/ac/yr

Sediment delivery: 0.40 t/ac/yr

Net C factor: 0.062

Net K factor: 0.31

Crit. slope length: -- ft

Surf. cover after planting: 32 %

Date	Operation	Vegetation	Surf. res. cov. after op, %
11/10/0	Manure spreader, liquid		84
11/11/0	Chisel plow, disk, st. pts., cover disks		36
4/1/1	Cultivator, field 6-12 in sweeps		37
4/3/1	Planter, double disk opnr w/fluted coulter	Corn, grain	32
10/10/1	Harvest, killing crop 50pct standing stubble		87

Soil conditioning index (SCI): 0.72

Avg. annual slope STIR: 96

Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

## **NUTRIENT MANAGEMENT PLAN**

### **Soil Testing Plan**

Soils will be tested a minimum of every 4 years to a depth of 7" in the fall after crop removal and prior to manure application. One sample shall be taken for each 2.5 acres. Samples shall be analyzed for pH, Phosphorus, and Potassium, at a minimum. (Source - *IL Agronomy Handbook, NRCS Standard 590*)

### **Manure Testing Plan**

Manure samples shall be taken annually during manure application from each storage facility and manure type (liquid or solid), and analyzed for Total N, Ammonium Nitrogen, Organic N, P<sub>2</sub>O<sub>5</sub>, and K<sub>2</sub>O.

### **Illinois Phosphorus Risk Assessment**

(*Illinois NRCS – Nutrient Management Standard, Code 590*)

Phosphorus (P) loading to surface water can accelerate eutrophication. The availability of other nutrients and light penetration into the water column will also influence the response of waterbodies to phosphorus. Land managers who desire to minimize transport of phosphorus need a practical assessment procedure to assist them in making decisions concerning the applications of phosphorus-containing materials.

Factors such as: the amount of erosion and runoff; the form, amount, and distribution of Phosphorus in the soil; and fertilizer and manure application rate, timing, and placement determine P loss from agricultural fields and the resulting P loading to water resources. Most phosphorus compounds found in soils have low water solubility. Consequently, P loss from agricultural land was once thought to be primarily associated with soil erosion. In many cases, sediment-bound P is still the dominant form in which P losses from agricultural fields occur. Over the past decade, research has shown that phosphorus can be lost in runoff in dissolved forms. High dissolved P concentration in runoff is more frequently observed where soil P levels are high particularly near the soil surface. High soil P levels, however, do not automatically equate to high dissolved P in runoff. As stated earlier, numerous factors interact to create the potential for P losses from agricultural fields. Many of the basic processes that govern P transport are known. It is difficult, however, to know at any given site which factor(s) influence P loss rates proportionally more than others. Insufficient data exist in Illinois to definitively guide landowners as to which factors in a specific field contribute the most to P losses. There are indications, however, that where solution P losses from crop fields are dominant, high soil P concentration at the surface are likely the most dominant factor.

The purpose of this guide is to (1) help land managers identify factors in agricultural fields known to contribute to "P" runoff loss and, (2) identify practices that can reduce phosphorus loss from agricultural fields. The factors most commonly associated with both dissolved and sediment-bound P loss are presented. For each factor, guidance is provided to help land managers estimate the relative potential for P transport to surface water. It is important to realize that the procedure is not a predictive tool for P loading. It is merely a tool for assessing the relative potential for phosphorus transport.

**Use of P Risk Assessment:**

When possible, land managers should adopt management practices that minimize phosphorus loss risk factors. If phosphorus containing materials need to be applied to fields that have medium or high risk potentials, recommended management practices should be used to reduce the risk of phosphorus transport.

**Examples of Practices to Reduce Phosphorus Risk Potential****Soil Erosion Control**

- Use residue management and/or structural practices to reduce sheet and rill erosion
- Install filter strips, riparian forest buffers, contour buffer strips, field borders, or wetlands

**Minimize Connectivity to Water Bodies**

- Install water and sediment control basins to reduce quantity of sediment transported offsite
- Install conservation buffers adjacent to water resources to create nutrient application setbacks

**Reduce Runoff Potential**

- Terrace fields to reduce slope length
- Contour strip cropping, contour buffer strips, cover crops, crop rotations that include meadow and/or small grains, and crop residue management

**Lower Soil Test Phosphorus**

- Sample soils on high testing fields to determine vertical distribution of the phosphorus
- If phosphorus is concentrated in the top two inches of soil, invert the soil (e.g. moldboard plow) where soil erosion will not be a problem
- Avoid stratification by placing phosphorus materials beneath the top two inches of the soil surface

**Practice Nutrient Management**

- Apply no more than maintenance levels of phosphorus when soil test P reaches the levels described in the Illinois Agronomy Handbook, Chapter 11.
- When soil test P levels reach 300 lb/acre, only maintenance P levels may be applied to land.

## Site Characteristic Definitions

1. **SOIL EROSION** – Sheet and rill erosion as measured by the most current version of the Revised Universal Soil Loss Equation (RUSLE).  
(Low = < T, Medium = >T, ≤ 2T, High = > 2 T)
2. **CONNECTIVITY TO WATER** – Defines the potential for P to be transferred from the site to a perennial stream or water body. The more closely connected the runoff is from the field via concentrated flow (from a defined grassed waterway or surface drain) to a perennial stream or water body the higher the potential for P transport.  
(Low = > 1,000', Medium = < 1,000', ≥ 200', High = < 200')
3. **RUNOFF CLASS** – Represents the effects of the Hydrologic Soil Group (A, B, C, D) on runoff. This factor represents the site's runoff vulnerability.  
(A = Low, B = Medium, C,D = High)
4. **SOIL "P" TEST (Bray P1 or Mehlich 3)** – Soil test procedure using the Bray P1 extraction, or other extraction test calibrated to bray P1, that provides an index of plant available P expressed in lbs. P/Acre (PPM x 2 = lbs./Acre where soil samples are obtained to the 6 2/3" depth)  
(Low = < 35 lbs/acre, Medium = 35-70 lbs/acre, High = > 70 lbs/acre)
5. **P INPUTS** – Represents the combined effect of application method and application rate on the potential for phosphorus to be transported in runoff in both dissolved and sediment-bound phases. Phosphorus application rate is expressed in terms of the University of Illinois maintenance phosphorus recommendations applicable to crops/yields grown on the site being evaluated. Phosphorus may be in the form of commercial fertilizer or organic materials such as manure, animal waste lagoon supernatant, wastewater from municipal or agricultural sources or nonagricultural biosolids such as sewage sludge or landscape waste. When using the "P Inputs Matrix", it is assumed that soil incorporation is performed prior to runoff events. Instances where incorporation is typically not performed prior to runoff events will be considered as non-incorporated surface applications.  
(See P Input Matrix Below)

### P INPUT MATRIX

Application Method	Application Rate		
	≤ UI Recommendations	> UI – 150% UI	> 150% UI
Incorporation or injection > 3" below surface	Low	Low	Low
Shallowly incorporated surface applications < 3"	Low	Medium	High
Non-incorporated surface applications	Medium	High	High

## **Phosphorus Risk Assessment for Individual Fields**

The table below identifies specific risk factors that may be present in a given field. No attempt has been made to “average” the factors and assign a composite rating for the field. It is recognized that risk factors do not act independently to influence phosphorus loss from agricultural fields and P loading into water resources. Simple averaging however, assumes that all risk factors have the same amount of influence. Attempts to objectively weight some factors more or less than others would be desirable, but difficult without supporting data. The phosphorus assessment procedure is not a process based or empirical model. The procedure was developed as a conservation planning tool. The tool is designed to provide guidance to select and plan conservation measures that will lower the potential for phosphorus loss from agricultural fields and P loading into water resources.

### **Explanation of General Risk Assessment Ratings**

**Low** – Low potential for P movement from the field. No adverse impacts to surrounding areas (i.e. surface waters) are anticipated if current farming practices are continued.

**Medium** – Medium potential for P movement from the field.

**High** - High potential for P movement from the field. Adverse impacts to surface waters from excess P loading may occur.

**Very High** - Very high potential for P movement from the field. Adverse impacts to surface waters are likely. No manure shall be applied until conservation practices are put into place to reduce the potential for P movement.

### **Explanation of Using P Risk Assessment for Manure Applications**

**Soil Erosion** – No manure will be applied to any field unless it rates “Low”

**Connectivity to Surface Water** – 200’ setbacks around all surface water will bring all fields under the “Medium” rating

**P soil test** – Fields in this plan have “Medium/Optimum” ratings for P soil tests. Planned manure applications will maintain P, and avoid excessive buildup.



**IL Phosphorous Risk Assessment**  
**Rancho Cantera LLC**

Field Name	Spread Acres	Connectivity to Surface Water	Runoff Potential	P1 Soil Test	P input Matrix
R/C 116	112.3	High	Medium	High	Low, incorporate or inject >3" below the surface
R/C 19.1	19.1	High	Medium	High	Low, incorporate or inject >3" below the surface
R/C 40	41.8	High	Medium	High	Low, incorporate or inject >3" below the surface
R/C 8.1	8.1	High	Medium	High	Low, incorporate or inject >3" below the surface
R/C 2.5	2.5	High	High	High	Low, incorporate or inject >3" below the surface
R/C 24.2	24.2	High	Medium	Medium	Low, incorporate or inject >3" below the surface
R/C 4.9	4.9	High	Medium	High	Low, incorporate or inject >3" below the surface
(b) (6)	61.4	High	Medium	High	Low, incorporate or inject >3" below the surface
(b) (6)	76.1	Medium or Low	Medium	Medium	Low, incorporate or inject >3" below the surface
(b) (6)	56.4	High	Medium	Medium	Low, incorporate or inject >3" below the surface
(b) (6)	4.9	High	Medium	High	Low, incorporate or inject >3" below the surface
(b) (6)	24.5	High	Medium	Medium	Low, incorporate or inject >3" below the surface
(b) (6)	60.1	High	High	High	Low, incorporate or inject >3" below the surface
(b) (6)	142.7	Medium or Low	Medium	High	Low, incorporate or inject >3" below the surface
(b) (6)	24.6	High	Medium	High	Low, incorporate or inject >3" below the surface
(b) (6)	85.3	High	Medium	High	Low, incorporate or inject >3" below the surface
(b) (6)	47.3	High	Medium	High	Low, incorporate or inject >3" below the surface
(b) (6)	66.9	High	Medium	High	Low, incorporate or inject >3" below the surface
(b) (6)	22.9	High	Medium	High	Low, incorporate or inject >3" below the surface
(b) (6)	15.4	High	Medium	High	Low, incorporate or inject >3" below the surface
(b) (6)	83.4	Medium or Low	Medium	High	Low, incorporate or inject >3" below the surface
(b) (6)	39.6	High	Medium	High	Low, incorporate or inject >3" below the surface
(b) (6)	133.5	High	Medium	High	Low, incorporate or inject >3" below the surface
(b) (6)	39.7	High	Medium	High	Low, incorporate or inject >3" below the surface
(b) (6)	147.9	Medium or Low	Medium	High	Low, incorporate or inject >3" below the surface
(b) (6)	77.0	High	Medium	High	Low, incorporate or inject >3" below the surface

## Nitrogen Risk Assessment

(Illinois NRCS-Nutrient Management Standard, Code 590)

Application Timing & Temp <sup>1</sup>	Soil Texture <sup>2</sup>		
	Coarse	Medium	Fine
Fall with inhibitor > 60°F	High	High	High
Fall with inhibitor < 60°F	High	Medium	Medium
Fall w/out inhibitor > 60°F	High	High	High
Fall w/out inhibitor < 60°F	High	Medium	Medium
Spring w/out inhibitor	Medium	Medium	Medium-Low
Spring with inhibitor	Medium-Low	Low	Low
Spring split-applied or sidedress	Medium-Low	Low	Low

<sup>1</sup> Temperatures refer to soil temperature measured at a depth of 4 inches. For this assessment, inhibitors refer to nitrification inhibitors

<sup>2</sup> Soil Texture:      Coarse: sand, loamy sand, sandy loam  
                              Medium: silt, silt loam, loam  
                              Fine: silty clay loam, silty clay, clay, clay loam, sandy clay, loam, sandy clay

Fields are categorized according to the predominant soil type of the field.

**Coarse:**

**Medium:** *All fields in this plan are predominantly silt loams*

**Fine:**

### Nitrogen Risk Assessment for Individual Fields

All fields in this plan have the same risk potential for N leaching under the following levels of management.

- High potential if applied in the fall with an inhibitor when soil temperature at a depth of 4" is greater than 60°F.
- Medium potential if applied in the fall with an inhibitor when soil temperature at a depth of 4" is less than 60°F.
- High potential if applied in the fall without an inhibitor when soil temperature at a depth of 4" is greater than 50°F.
- Medium potential if applied in the fall without an inhibitor when soil temperature at a depth of 4" is less than 50°F.
- Medium (medium soils) or medium-low (fine soils) potential if applied in the spring without an inhibitor.
- Low potential if applied in the spring with an inhibitor.
- Low potential if applied in the spring split applied or sidedressed.

## ***Commercial Nitrogen Fertilizer Management.***

A bushel of corn contains approximately 0.8 lbs of nitrogen (N), thus a 200-bushel corn crop removes about 160 pounds of N from the field<sup>1</sup>. For those corn acres not receiving manure applications it is necessary to apply commercial nitrogen to meet the nitrogen demand of the planted crop. Until recently the guideline in Illinois was to apply 1.2 pounds of nitrogen per bushel of expected yield. Recent research has indicated that modern hybrids grown in Illinois Soils may not need as much N as previous recommendations have suggested.

The new approach recommended in the most current version of the Illinois agronomy handbook takes into consideration the value of Corn and the return to investment of additional N fertilizer. The Maximum Return to N (MRTN) is the point in which the yield increase for adding additional N just pays for the N added. Further Reading regarding the MRTN approach can be found in the Managing Nitrogen Section of the Illinois Agronomy Handbook.

The MRTN approach was a result of collaborative efforts between several Midwestern universities. Iowa State University hosts a website where N rate guidelines can be calculated using this approach. The website can be found at:

<http://extension.agron.iastate.edu/soilfertility/nrate.aspx>

The Illinois Agronomy Handbook describes the output of the MRTN Corn Nitrogen Rate Calculator as a guideline to N application rate. These guidelines are intended to be used as a decision aid rather than a fixed recommendation. However Illinois Agronomy Handbook strongly recommends that the new method be used for calculating N rates and that the Yield based N recommendations system no longer be used.

The N rate calculator was designed based on current N and corn prices. If N prices drop and corn prices rise so that the ratio drops to 0.05 or less (cost of N/Price of Corn), calculated N rates could be very high. The N rate calculator has built in limits and will not calculate N rates above 240 lbs per acre. In order to reach this limit corn would have to be \$8 per bushel and N would have to cost less than 25 cents per pound.

It is recommended that when using manure, sewage sludge, or other N sources that usually cost less per pound of N than commercial fertilizers that a conservative approach to assigning value to those products be used. One such approach is to price the pounds of crop-available N the same as would be for a pound of N from a commercial fertilizer source. Available N from manure sources can vary and it is recommended that actual manure analysis be used to determine N available.

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<sup>1</sup> Illinois Agronomy Handbook, 24<sup>th</sup> Edition.

## How to Use the Calculator<sup>2</sup>

- Choose if you want to calculate for one set of prices or multiple prices (price ratio of N and corn).
- Choose which state you are interested in, or the region of a state or the soil yield potential grouping.
- Choose the rotation, either corn following soybean or corn following corn.
- Check if you want to include non N responsive sites (sites that had no yield increase to N application).
- Choose the N fertilizer product and price, and corn grain price. If you use the multiple price ratio option, then you can choose four prices for N and corn grain (four ratios). The prices for N and corn have default values already entered. You may enter either the product cost (\$/ton) or unit cost (\$/lb N).
- Hit the calculate button to run the calculations. This will take you to the results section. If you choose N or corn prices that are too high or low, you may get an error message in the results section. If that happens, please try another set of prices.

## State Information

- **Illinois Geographic Region** – Sites for Illinois are grouped by geographic location in the state: North, Central, and South. Northern Illinois runs from the Wisconsin border and includes those counties through which Interstate Route 80 runs. Southern Illinois includes the counties through which Interstate Route 70 runs, and the southern parts of counties (Shelby, Montgomery, Macoupin) north of those where soils have lower organic matter. Central Illinois is the area in between, and might also be considered to include southern portions of large counties (Henry, Bureau, LaSalle) through which I-80 runs. When in doubt in "border" areas, assign higher organic-matter soils to the northern of two areas and lower OM soils to the more southern area.

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<sup>2</sup> Taken from the Nitrogen Rate Calculator Website (<http://extension.agron.iastate.edu/soilfertility/nrate.aspx>)



## Definitions

- **EONR** – Economic optimum N rate, the point where the last increment of N returns a yield increase large enough to pay for the additional N.
- **MRTN** – Maximum return to N, the N rate where the economic net return to N application is maximized.
- **Maximum Yield** – The yield where application of more N does not result in yield increase.
- **Net Return** – The value of corn grain produced minus the N fertilization cost.
- **Price Ratio** – The ratio of N fertilizer price to corn grain price (\$/lb:\$/bu).
- **Site** – The land area occupied by a N rate trial, either replicated small plots in a specific field area or replicated field-length strips.
- **Site N Responsiveness** – The corn grain yield increase with N application, non-responsive indicates no yield increase with N application while high response indicates large yield increase from N application.
- **Gross (Yield) Return** – The value of corn grain increase due to N application.

## Calculated Values

The results of calculations are provided in a table and in up to four graphs. Also, the chosen input information that went into the calculations is displayed.



## Displayed Input Information

- State.
- The number of N rate trials (sites) that fit the chosen criteria and used in the calculations.
- The rotation.
- An indication if non-responsive sites are included in the calculations.
- The N fertilizer and corn grain prices, and the price ratio(s).

## Tables

Table 2. Example of results table using MRTN website

N Price (\$/lb N):	\$0.34	\$0.43	\$0.52	\$0.61
Corn Price (\$/bu):	\$4.50	\$4.50	\$4.50	\$4.50
Price Ratio:	0.08	0.1	0.12	0.14
RTN Rate (lb N/acre):	180	170	161	154
Profitable N Rate Range (lb N/acre):	165 - 196	156 - 185	148 - 175	141 - 166
Net Return to N at MRTN Rate (\$/acre):	\$301.01	\$285.30	\$270.43	\$256.29
Percent of Maximum Yield at MRTN Rate:	99%	98%	98%	98%
UAN (28% N) at MRTN Rate (lb product/acre):	643	607	575	550
UAN (28% N) Cost at MRTN Rate (\$/acre):	\$61.20	\$73.10	\$83.72	\$93.94

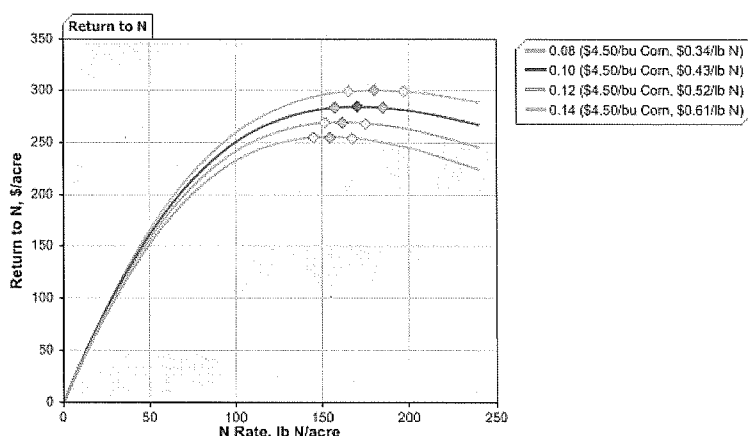
- **MRTN Rate (lb N/acre)**, is the N rate at the MRTN. For the data set, rotation, and price ratio(s), the MRTN rate would be the suggested rate to apply for maximizing net return to N application.
- **Profitable N Rate Range (lb N/acre)**, is the N rate values at a \$1/acre net return range (LOW and HIGH) around the MRTN. An N rate within this range around the MRTN would provide similar expected economic return and could be considered the profitable N rate range.
- **Net return to N at MRTN Rate (\$/acre)**, is the economic net return at the MRTN rate.
- **Percent of maximum yield** is the proportion of yield that might be produced at the MRTN rate and LOW/HIGH N rate range compared to the yield at the maximum response to N. It is not economical to attempt to apply N at a rate that would result in maximum yield or meet the N requirements of all sites (100% maximum yield), including the few most responsive sites. An economic rate will always result in less than 100% of maximum yield, that is, the MRTN rate will result in yield less than maximum. How far less than maximum depends on the price ratio of N and corn grain. For producers that are willing to tolerate more risk in their corn production system, then N application toward the LOW rate will have on average lower N input cost, but more frequently may supply N below maximum economic response. For producers with greater aversion to risk in their corn production system, then N application toward the HIGH rate will more frequently supply N that is at least adequate to meet corn N needs, but have on average greater N input cost and more frequently be above maximum economic response.

- **Nitrogen Product at MRTN Rate (lb product/acre)**, is the amount of product at the MRTN rate.
- **Nitrogen Product Cost at MRTN Rate (\$/acre)**, is the cost of N at the MRTN rate.

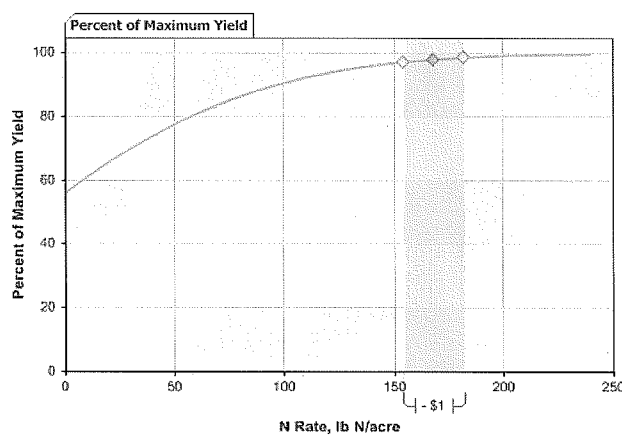
## Charts

Four graphs are available for viewing. Each presents a different component of the economic rate calculations, and compliment results shown in the table.

- **Return to N.** This graph shows the two components for calculating net return across N rates; the gross return from yield increase and the fertilizer cost. The net economic return to N is the difference between these two values at each N rate. The point of maximum net return (MRTN, solid symbol) and the profitable N rate range (shaded symbol) within \$1/acre of the maximum is shown on the graph. The N rate at the MRTN provides the greatest economic return to N application for the dataset, prices, and rotation chosen and would be the suggested N application rate. If multiple price ratios are chosen, then only net return to N is shown for each ratio.

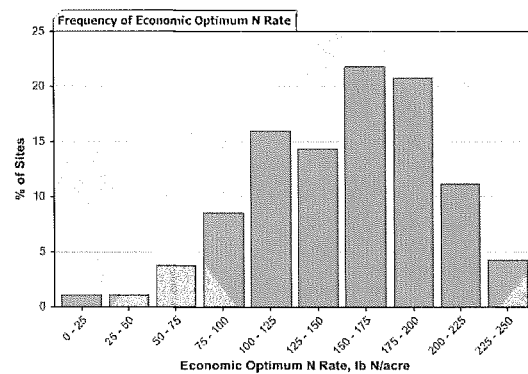


- **Percent of maximum yield.** This graph shows the percent of maximum yield across N rates for all sites in the dataset and rotation chosen. The N rate at the MRTN and the profitable N rate range (LOW - HIGH) within \$1/acre of the MRTN are shown. As N rates move toward the LOW end of the range, the risk of having inadequate N increases and percent of maximum yield decreases, while as N rates move toward the HIGH end of

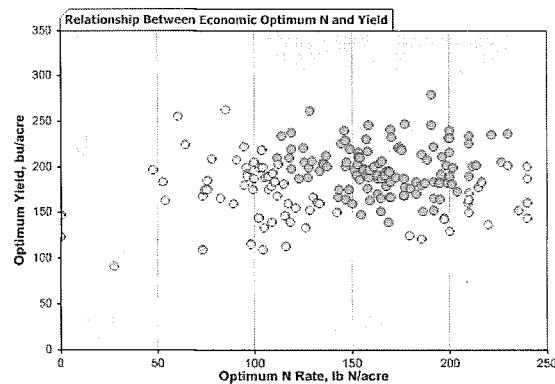


the range the risk of having inadequate N decreases and percent of maximum yield increases. The greater the N cost relative to corn grain price (the larger the price ratio), the lower the economic rate, the farther the MRTN rate moves down the N response curve, and the more yield will be below the maximum yield. This graph helps with decisions regarding choice of N rate in regard to risk management. Reducing risk of insufficient N (that is, using a higher N rate) does result in greater N input cost, which in the long run could reduce economic return to N use. If multiple price ratios are chosen, then the percent of maximum yield is shown for each ratio.

- **EONR Frequency.** This graph shows the frequency distribution, in 25 lb N increments, of the EONR for each site in the dataset and rotation chosen. The higher the bar for a N rate increment the more times sites had an EONR in that increment. Typically N trial datasets have a range of EONR values, with the most frequent range of EONR's being around the MRTN value. If multiple price ratios are chosen, then the frequency of EONR is shown for each ratio.



- **EONR vs. Yield.** This graph shows the relationship between the site EONR and yield at the EONR for each site in the dataset and rotation chosen. The number of symbols will match the number of sites in the dataset. You can scroll the cursor over the symbol to see the state, county, and manure history for that site. If multiple price ratios are chosen, then the graph will display the results for the first ratio.



Several scenarios have been run using the Nitrogen Rate calculator. These scenarios are provided in order to guide nitrogen applications on areas where manure is not applied. The following table is a summary of those scenarios.

**Table 1. Summary of scenarios calculated using the MRTN rate calculation website.**

*All scenarios were calculated using a corn value of \$4.50 per bushel*

<b>Crop Rotation</b>	<b>Fertilizer Type</b>	<b>Cost Per Ton</b>
Corn following Soybeans	Anhydrous Ammonia (82%)	550-1000
Continuous Corn	Anhydrous Ammonia (82%)	550-1000
Corn following Soybeans	UAN (28%)	190-342
Continuous Corn	UAN (28%)	190-342

Producers are encouraged to use the online version of the Nitrogen Rate Calculator to fine tune Nitrogen Application Rates.

# Corn Nitrogen Rate Calculator

Finding the Maximum Return To N and Most Profitable N Rate

*A Regional (Corn Belt) Approach to Nitrogen Rate Guidelines*

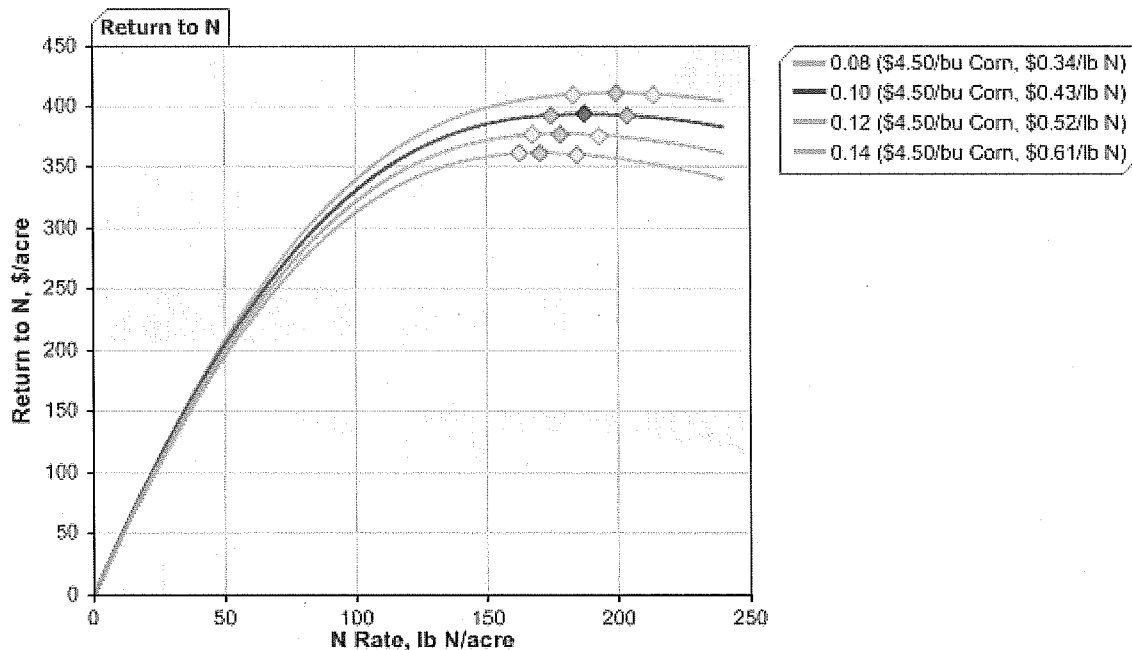
State: Illinois - Central

Number of sites: 93

Rotation: Corn Following Corn

Non-Responsive Sites Not Included

Anhydrous Ammonia (82% N) Cost per Ton	\$550	\$700	\$850	\$1000
N Price (\$/lb N):	\$0.34	\$0.43	\$0.52	\$0.61
Corn Price (\$/bu):	\$4.50	\$4.50	\$4.50	\$4.50
Price Ratio:	0.08	0.10	0.12	0.14
RTN Rate (lb N/acre):	199	187	178	170
Profitable N Rate Range (lb N/acre):	183 - 213	173 - 203	165 - 192	158 - 183
Net Return to N at MRTN Rate (\$/acre):	\$412.24	\$394.87	\$378.44	\$362.79
Percent of Maximum Yield at MRTN Rate:	99%	99%	98%	98%
Anhydrous Ammonia (82% N) at MRTN Rate (lb product/acre):	243	228	217	207
Anhydrous Ammonia (82% N) Cost at MRTN Rate (\$/acre):	\$67.66	\$80.41	\$92.56	\$103.70



# Corn Nitrogen Rate Calculator

Finding the Maximum Return To N and Most Profitable N Rate

*A Regional (Corn Belt) Approach to Nitrogen Rate Guidelines*

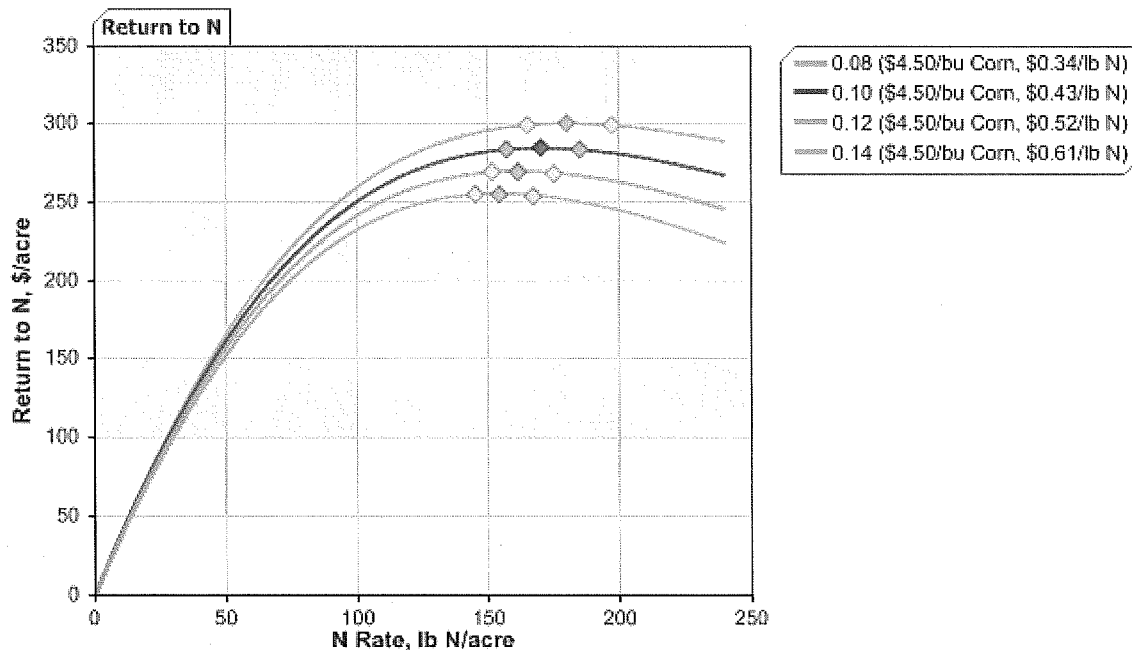
State: Illinois - Central

Number of sites: 188

Rotation: Corn Following Soybean

Non-Responsive Sites Not Included

Anhydrous Ammonia (82% N) Cost per Ton:	\$550	\$700	\$850	\$1000
N Price (\$/lb N):	\$0.34	\$0.43	\$0.52	\$0.61
Corn Price (\$/bu):	\$4.50	\$4.50	\$4.50	\$4.50
Price Ratio:	0.08	0.10	0.12	0.14
RTN Rate (lb N/acre):	180	170	161	154
Profitable N Rate Range (lb N/acre):	165 - 196	156 - 185	148 - 175	141 - 166
Net Return to N at MRTN Rate (\$/acre):	\$301.01	\$285.30	\$270.43	\$256.29
Percent of Maximum Yield at MRTN Rate:	99%	98%	98%	98%
Anhydrous Ammonia (82% N) at MRTN Rate (lb product/acre):	220	207	196	188
Anhydrous Ammonia (82% N) Cost at MRTN Rate (\$/acre):	\$61.20	\$73.10	\$83.72	\$93.94





# Corn Nitrogen Rate Calculator

Finding the Maximum Return To N and Most Profitable N Rate

*A Regional (Corn Belt) Approach to Nitrogen Rate Guidelines*

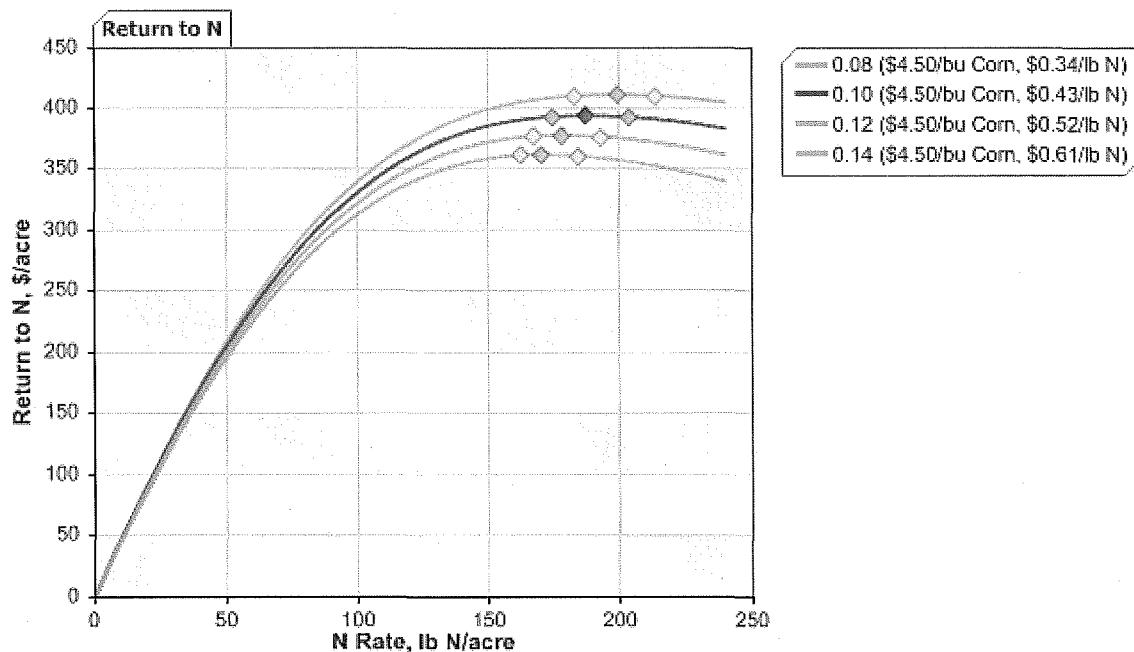
State: Illinois - Central

Number of sites: 93

Rotation: Corn Following Corn

Non-Responsive Sites Not Included

UAN (28%) Cost per Ton	\$190	\$241	\$291	\$342
N Price (\$/lb N):	\$0.34	\$0.43	\$0.52	\$0.61
Corn Price (\$/bu):	\$4.50	\$4.50	\$4.50	\$4.50
Price Ratio:	0.08	0.10	0.12	0.14
RTN Rate (lb N/acre):	199	187	178	170
Profitable N Rate Range (lb N/acre):	183 - 213	173 - 203	165 - 192	158 - 183
Net Return to N at MRTN Rate (\$/acre):	\$412.24	\$394.87	\$378.44	\$362.79
Percent of Maximum Yield at MRTN Rate:	99%	99%	98%	98%
UAN (28% N) at MRTN Rate (lb product/acre):	711	668	636	607
UAN (28% N) Cost at MRTN Rate (\$/acre):	\$67.66	\$80.41	\$92.56	\$103.70



# Corn Nitrogen Rate Calculator

Finding the Maximum Return To N and Most Profitable N Rate

*A Regional (Corn Belt) Approach to Nitrogen Rate Guidelines*

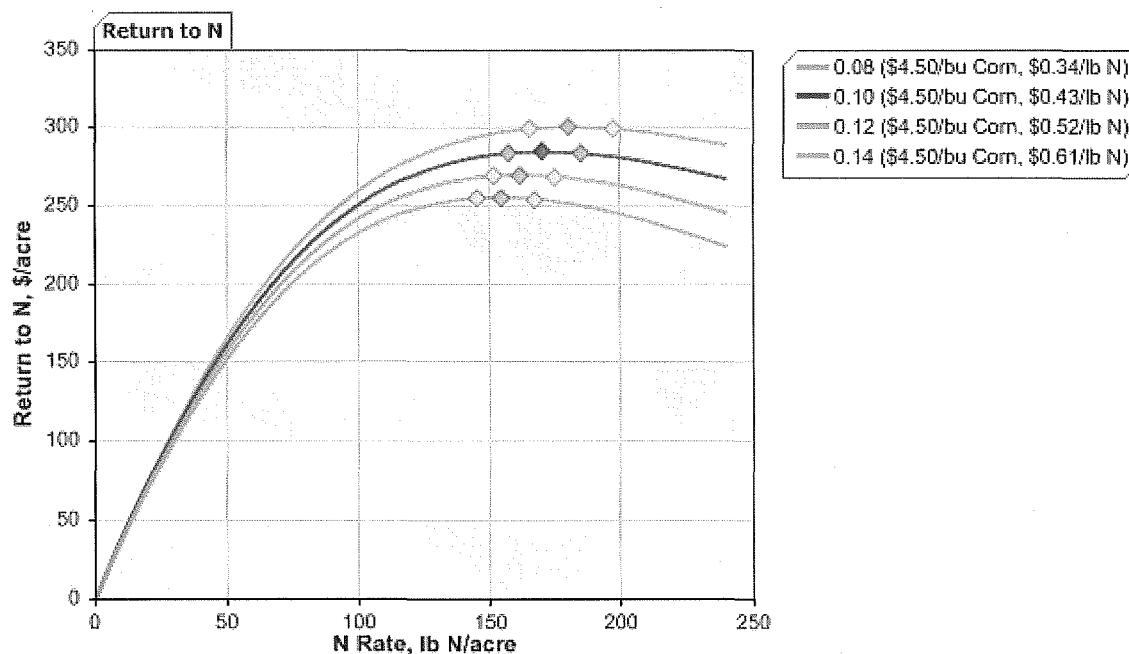
State: Illinois - Central

Number of sites: 188

Rotation: Corn Following Soybean

Non-Responsive Sites Not Included

UAN (28%) Cost per Ton	\$190	\$241	\$291	\$342
N Price (\$/lb N):	\$0.34	\$0.43	\$0.52	\$0.61
Corn Price (\$/bu):	\$4.50	\$4.50	\$4.50	\$4.50
Price Ratio:	0.08	0.10	0.12	0.14
RTN Rate (lb N/acre):	180	170	161	154
Profitable N Rate Range (lb N/acre):	165 - 196	156 - 185	148 - 175	141 - 166
Net Return to N at MRTN Rate (\$/acre):	\$301.01	\$285.30	\$270.43	\$256.29
Percent of Maximum Yield at MRTN Rate:	99%	98%	98%	98%
UAN (28% N) at MRTN Rate (lb product/acre):	643	607	575	550
UAN (28% N) Cost at MRTN Rate (\$/acre):	\$61.20	\$73.10	\$83.72	\$93.94



# **Rancho Cantera LLC**

## **Storm Water Management Plan**

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### **Site Location**

The facility is located in sections 15 of Township 27-North Range 5-East of the 4<sup>th</sup> P.M. in Stephenson County Illinois. This is approximately a 3.5 acre site consisting of one cattle building, a cattle feeding area, and an open lot. This facility is located in a rural agricultural area where row crops are grown. Yellow Creek lies approximately 500 feet East of the facility perimeter. Attachment A is a facility map, which illustrates the layout of this site.

### **Storm Water Management**

All storm water is directed away from the facility buildings and facilities. The finished man-made and surrounding natural topography allows all surface water to flow away from the facility in a southerly direction. The buildings were built on a relatively level portion of land. The surrounding topography and the gravel allow the storm water to disperse away from individual buildings and the site. The excess storm water leaving the site will run through heavily vegetated areas and eventually drain towards Yellow Creek.

### **Facility Access**

The facility is accessible through one private gravel drive. Only facility employees, feed/animal transportation vehicles or facility service personnel are permitted at the facility for reasons of bio-security. All animal transportation vehicles are required to enter the site clean and free of animal waste or other debris. No vehicles entering the site will be permitted to clean, wash, or empty excess materials onto the ground of the site.

### **Facility Commodity Management**

The products utilized at the facility consist of feed for facility livestock. Feed is transferred directly from the transportation vehicle to storage areas. Spilled feed will be picked up regularly.

### **Facility Mortality Management**

On the rare occasion in which mortalities occur the facility uses a rendering service to handle mortality disposal.

### **Litter Management**

A proper number of dumpsters will be provided on site to handle debris and litter associated with the facility. The litter will be disposed of in an appropriate and timely manner.

### **Hazardous Waste**

There is no and will be no hazardous waste generated at this site.

### **Maintenance/Inspection Procedures**

Facility roads, commodity storage areas, etc., will be inspected at least once a month. A maintenance inspection report will be recorded following each inspection. A copy of the inspection form is provided as Attachment B.

## **Storm Water Best Management Practices**

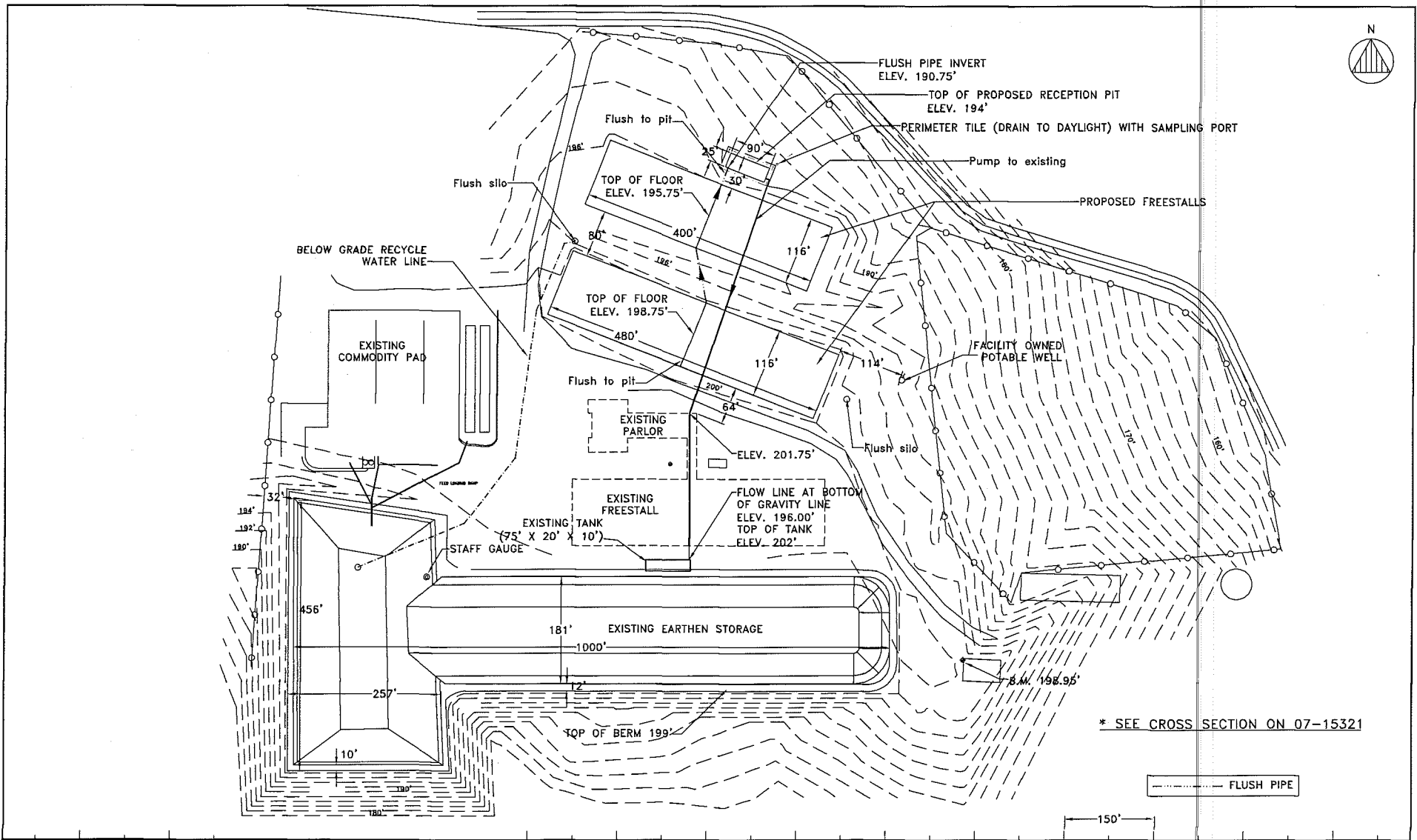
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### **Grounds:**

- Maintain sufficient surface drainage away from buildings.
- Permanent vegetation will be maintained across the facility.
- Divert rain water away from areas where it could pond.
- Maintain proper gravel cover and landscape gradient so that water does not stand in access roads and around the production facility.
- Remove any spilled feed promptly.

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ATTACHMENT A  
FACILITY PLOT PLAN



**Frank & West**  
Environmental Engineers, Inc.

7226 N. State Route 29  
Springfield, IL 62707

Phone: 217/487-7686  
Fax: 217/487-7687

RANCHO CANTERA, LLC.

PLOT PLAN

DRAWN BY: CEO

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DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

SCALE: AS SHOWN DATE: 09/13/10 REVISED ON: 12/03/10 DRAWING NO. 07-15327



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**ATTACHMENT B**  
**INSPECTION FORM**

Rancho Cantera, LLC  
Stormwater Management Plan  
Inspection Report Form  
To Be Complete Every Month

Inspector: \_\_\_\_\_ Date: \_\_\_\_\_

Inspector's Qualifications: \_\_\_\_\_

Days Since Last Rainfall: \_\_\_\_\_ Amount of Last Rainfall: \_\_\_\_\_

Area	Date of Last Inspection	Date of Next Inspection	Stabilized	Yes/No	Condition of Vegetation	Visible Erosion
Facility Structures						
Access Drive/Areas						
Vegetated Areas						
Materials Handling Areas (not livestock waste)						
Refuse Sites						
Mortality Areas						
Materials Handling Equipment Storage Areas						
Shipping/Receiving Areas						

Comments: \_\_\_\_\_  
\_\_\_\_\_

Action(s) Required: \_\_\_\_\_  
\_\_\_\_\_

To Be Performed By: \_\_\_\_\_ On or Before: \_\_\_\_\_

## Considerations for Manure Application

### **Setbacks**

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*(Illinois Livestock Management Facilities Act, Section 900.803)*

- Applications within ¼ mile of any residence not part of the facility must be injected or incorporated on the day of application UNLESS operation was in existence prior to May 21, 1996 and is applying via irrigation or this existing facility is applying waste on frozen ground
- Manure may not be applied within 200' of surface water unless the water is upgrade or there is adequate diking
- Manure may not be applied within 150' of potable water supply wells
- Manure may not be applied in a 10-year flood plain UNLESS manure is injected or incorporated
- Manure may not be applied in grass waterways

## **Winter Application of Manure**

Application to frozen or snow-covered soils is not recommended. However, if manure application is necessary, only small amounts shall be applied that adequately address waste storage concerns until non-frozen land is available. These instances must be documented in the CNMP records. If winter application is deemed necessary, applications are to be applied only if ALL the following criteria are met:

Application rate is limited to 10 wet tons/acre for solid manure more than 50% moisture and 5 wet tons for manure less than 50% moisture. Applications are to be made on land with at least 90% surface residue cover (e.g. good quality hay or pasture field, all corn grain residue remaining after harvest, all wheat residue cover remaining after harvest).

Manure shall not be applied on more than 20 contiguous acres. Contiguous areas for application are to be separated by a break of at least 200 feet. Utilize those areas for manure application that are furthest from streams, ditches, waterways, surface water, etc. (areas that present the least runoff potential and are furthest from surface water).

Increase the application setback distance to 200 feet "minimum" from all grassed waterways, surface drainage ditches, streams, surface inlets, water bodies. This setback distance may need to be further increased due to local conditions.

Additional winter application criteria for fields with significant slopes more than 5%. Manure shall be applied in alternating strips 60 to 200 feet wide generally on the contour, or in the case of contour strips on the alternating strips. The fields must have erosion control practices implemented and have a RUSLE2 soil loss of less than T.

## **Manure Application on Steep Fields**

Waste shall not be applied to land with slopes over 15%.

## **Manure Application on Fields Subject to Flooding**

Manure is not to be land-applied on soils that are frequently flooded during the period when flooding is expected unless incorporated immediately.

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### **General Liquid Manure Applications**

For liquid wastes, the application rate is to be adjusted to the most limiting factor to avoid ponding, surface runoff, subsurface drainage (tile) discharge, the nutrient needs of the field, or the nitrogen or phosphorus risks of the field. The total application is not to exceed the field capacity of the upper 8 inches of soil. See the guide for determining soil moisture content below. No applications should be made when the field reaches 100% of its available capacity. The actual application rate shall be adjusted during application to avoid ponding or runoff. Bare/crusted soils may require some tillage to improve infiltration.

### **Tile Drained Fields**

Fields or areas of fields that are subsurface (TILE) drained require additional precautions. When liquid wastes are applied to fields with TILE drains, the liquid can follow soil macro-pores (in dry soils) directly to the tile drains creating a surface water pollution hazard from direct tile discharge. (A field is considered TILE drained if  $\frac{1}{2}$  or more of the field is subsurface (tiled) drained; however, even a field with one subsurface drainage line may present a risk of manure/wastewater movement to subsurface drains and cause a direct discharge. Do not apply application rates (volume) that would exceed AWC in the upper 8 inches.

Prior to manure application, use a tool (AERWAY tool or similar tool) that can disrupt/close (using horizontal fracturing) the preferential flow paths (worm holes, cracks, root channels) in the soil, or till the surface of the soil 3-5 inches deep to a condition that will absorb the liquid wastes. The purpose is to have the surface soil act as a sponge to soak up the liquid manure and keep it out of preferential flow channels. This is especially important if shallow tile are present (<2 feet deep). Any pre-application tillage should leave as much residue as possible on the soil surface. The adsorption of liquid manure by the soil in the root zone will minimize nitrogen loss and the manure/nutrient runoff potential. For perennial crops (hay or pasture), or continuous no till fields where tillage is not an option, all tile outlets from the application area are to be plugged prior to application. This criteria (4b.) may be waived if the producer can verify there is no prior history of manure discharge via subsurface drains. However, if there is a discharge, the producer is liable for damages and may risk being classified as a CAFO.

If injection is used, inject only deep enough to cover the manure with soil. Till the soil at least 3 inches below the depth of injection prior to application, or all tile outlets from the application area are to be plugged prior to application. This criteria may be waived if the producer can verify there is no prior history of manure discharge via subsurface drains. However, if there is a discharge the producer is liable for damages and may risk being classified as a CAFO.

In addition to tillage prior to surface liquid waste application or injection, install in-line tile flow control structures or (inflatable) tile plugs that can mechanically stop or regulate tile flow either

prior to application, or have on site if needed to stop tile flow. Use caution not to back tile water where it may impair the functioning of an offsite subsurface drainage system. This criteria may be waived if the producer can verify there is no prior history of manure discharge via subsurface drains. However, if there is a discharge the producer is liable for damages and may risk being classified as a CAFO.

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Repair broken tile or blow holes prior to application.



## **Guide to Determining Soil Moisture Content**

*Soil Conditions that apply to fields in this plan are in **bold**.*

<b>Available Moisture Remaining in the Soil</b>	<b>Sand-Sandy Loam</b>	<b>Loam-Silt Loam</b>	<b>Clay Loam-Clay</b>
<b>0% moisture Wilting point</b>	Dry and loose; flows through fingers	<b>Powdery, sometimes slightly crusted but easily broken into powder</b>	Hard, baked and cracked; difficult to break into powder
<b>50% or less soil moisture</b>	Loose, feels dry	<b>Forms a weak ball when squeezed but will not stick to tools</b>	Pliable but not slick, balls under pressure, sticks to tools
<b>50-75% or less soil moisture</b>	Balls under pressure, but seldom holds together when bounced in hand	<b>Forms a ball under pressure; somewhat plastic; slicks slightly under pressure. Does not stick to tools</b>	Forms a ball; ribbons out between thumb and forefinger, has a slick feeling
<b>75% to Field Capacity</b>	Forms a weak ball, breaks easily when bounced in the hand; can feel moistness	<b>Forms ball; very pliable; slicks readily if relatively high in clay, clings slightly to tools</b>	Easily ribbons out between fingers; has a slick feeling, very sticky.
<b>100% Field Capacity</b>	Soil mass clings together. Upon squeezing, outline of ball is left on hand.	<b>On squeezing, no free water appears on soil, but wet outline of ball on hand</b>	On squeezing, no free water appears on soil, but wet outline of ball on hand. Sticky enough to cling to fingers

## **Livestock Management Facilities Act Regulatory Provisions**

For facilities with > 1,000 animal units,  
follow these guidelines on manure application to conform to  
state regulatory provisions for the LMFA.

---

- o)** Waste applied within 1320' (1/4 mile) of any residence not part of facility shall be injected or incorporated on the day of application
- p)** Waste shall not be applied within 200' of surface water unless the water is up-gradient or there is adequate diking and waste will not be applied within 150' of potable water supply wells
- q)** Waste shall not be applied within a 10-year floodplain unless the injection or incorporation method is used
- r)** Waste shall not be applied in waterways
- s)** Waste that is spread on frozen or snow-covered ground will be limited to land areas with:
  - 1. less than 5% slope, OR
  - 2. adequate erosion control provisions exist
- t)** Certified livestock manager shall inspect all bermtops, exterior berm sides, and non-submerged interior berm sides for evidence of erosion, burrowing animal activity, and other indications of berm degradation on a frequency of not less than once every two weeks
- u)** Waste shall not be applied during a rainfall or to saturated soil and that conservative waste loading rates will be used in the case of a high water table or shallow earth cover to fractured bedrock. Caution should be exercised in applying livestock wastes, particularly on porous soils, so as not to cause nitrate or bacteria contamination of groundwaters.

## **Land Application Record Keeping**

Records must be maintained for 5 years

The producer must maintain records to document plan implementation. Records should include the following, when applicable:

- soil test results and recommendations for nutrient application
- amounts, analyses, and source of nutrients applied
- dates and method of nutrient applications
- crop rotations, planting and harvesting dates, yields, and crop residues removed
- results of water, plant, and organic by-product analyses
- dates of review, person performing review, and recommendations that resulted from the review of the CNMP

## **Operation and Maintenance for CNMP**

- Periodic review of plan to determine if adjustments or modifications to the plan are needed. At a minimum, the plan should be reviewed and revised with each soil test cycle (recommended annually).
- Protection of fertilizer and organic by-product storage facilities from weather and accidental leakage or spillage,
- Calibration of application equipment to ensure uniform distribution of material at planned rates
- Documentation of the actual rates at which nutrients were applied. When the actual rates differ from the planned rates, records will indicate reasons for the differences.

**Rancho Cantera LLC****Recommended Application Rates**

<u>Crop</u>	<u>Yield</u>	<u>Crop Rotation</u>	<u>Application Method</u>	<u>Manure Source</u>	<u>N rate</u>	<u>P rate</u>
					<u>Gallons/Acre</u>	<u>Gallons/Acre</u>
Corn	150	Continuous Corn	Irrigate	Earthen Holding Pond	26,700	7,300
Corn	175				26,700	8,500
Corn	200				26,700	9,700

*These recommended rates are based on the stated yields and crops, and assumes fields have NO recent manure applications (no N credits from manure application). These are estimates only, and can be used as guides when climate or other factors exist that require deviations from planned manure applications. Previous applications would require that these application rates be decreased from present estimates.*

*The recommended application rates are the rates needed to meet the nutrient requirement of the planned crop. In the case of Lagoon water and Solid manure actual application of waste at these rates may not be feasible due to volume and or water holding capacity of soil.*

*N available 1st year = (Am-N \* App Method Efficiency) + (OrgN \* .35)*

*Previous manure applications should be given N credits =*

*(App rate (in 1,000 gal) \* Org N (per 1,000 gal) \* Mineralization Factor) / 2*

*Mineralization Factors: Year 1 = .35, Year 2 = .175, Year 3 = .0875, Year 4 = 0.04*

*Efficiency of Application = Liquid, Broadcast = 0.80, Solid, Broadcast = 0.75, Aerway = 0.90, Liquid Inject = 0.98*

**Running Totals of Manure Production**  
**Rancho Cantera LLC**

		<b>Total</b>	<b>Year End</b>		<b>Year End</b>
		<b>Produced</b>	<b>Produced</b>	<b>Total Applied</b>	<b>Totals</b>
		<b>gallons</b>	<b>gallons</b>	<b>gallons</b>	<b>gallons</b>
<b>CROP</b>					
<b>YEAR</b>					
<b>2011</b>	Holding Pond	16,418,739	16,418,739	16,424,911	-6,172
<b>2012</b>	Holding Pond	16,418,739	16,412,567	16,411,610	957
<b>2013</b>	Holding Pond	16,418,739	16,419,696	16,303,179	116,517
<b>2014</b>	Holding Pond	16,418,739	16,535,256	16,500,750	34,506

### Summary of Manure Applications

Applications are entered for the crop year (i.e. 2008 applications are applied in Fall 2007 - Spring 2008 for 2008 crop)

FSA Tract #	Field Name	Acres Available for Application	Year	Crop	Planned Manure (1000 gal)	Planned Manure (total gal)	Manure Source	Planned N Applied lbs/ac	Planned P Applied lbs/ac	Planned K Applied lbs/ac	Commercial N Needed (lbs/ac)
562	R/C 116	112.33	2009	Corn							
			2010	Corn	0.0	0	Holding Pond	0	0	0	197
1970			2011	Corn	9.4	1,059,490	Holding Pond	70	84	123	127
			2012	Corn	9.4	1,059,490	Holding Pond	70	84	123	107
			2013	Corn	9.4	1,059,490	Holding Pond	70	84	123	96
14			2014	Corn	9.4	1,059,490	Holding Pond	70	84	123	91
562	R/C 19.1	19.06	2009	Corn							
			2010	Corn	15.7	299,242	Holding Pond	116	116	140	81
1970			2011	Corn	0.0	0	Holding Pond	0	0	0	180
			2012	Corn	9.4	179,773	Holding Pond	70	84	123	119
			2013	Corn	9.4	179,773	Holding Pond	70	84	123	113
5			2014	Corn	9.4	179,773	Holding Pond	70	84	123	110
562	R/C 40	41.76	2009	Corn							
			2010	Corn	15.7	655,632	Holding Pond	116	116	140	81
1970			2011	Corn	15.0	626,400	Holding Pond	111	133	196	69
			2012	Corn	23.3	972,728	Holding Pond	172	207	304	0
			2013	Corn	21.5	899,050	Holding Pond	159	191	281	0
7			2014	Corn	0.0	0	Holding Pond	0	0	0	154
562	R/C 8.1	8.1	2009	Corn							
			2010	Corn	0.0	0	Holding Pond	0	0	0	197
1970			2011	Corn	15.0	121,500	Holding Pond	111	133	196	86
			2012	Corn	0.0	0	Holding Pond	0	0	0	181
			2013	Corn	25.6	207,159	Holding Pond	189	227	334	0
3			2014	Corn	22.3	180,879	Holding Pond	165	199	291	0



**Summary of Manure Applications continued**

Applications are entered for the crop year (i.e. 2008 applications are applied in Fall 2007 - Spring 2008 for 2008 crop)

FSA Tract #	Field Name	Acres Available for Application	Year	Crop	Planned Manure (1000 gal)	Planned Manure (total gal)	Manure Source	Planned N Applied lbs/ac	Planned P Applied lbs/ac	Planned K Applied lbs/ac	Commercial N Needed (lbs/ac)
562	R/C 2.5	2.5	2009	Corn							
			2010	Corn	0.0	0	Holding Pond	0	0	0	197
1970			2011	Corn	0.0	0	Holding Pond	0	0	0	197
			2012	Corn	0.0	0	Holding Pond	0	0	0	197
			2013	Corn	9.4	23,580	Holding Pond	70	84	123	127
1			2014	Corn	9.4	23,580	Holding Pond	70	84	123	117
562	R/C 24.2	24.2	2009	Corn							
			2010	Corn	15.7	379,940	Holding Pond	116	116	140	81
1970			2011	Corn	9.4	228,253	Holding Pond	70	84	123	110
			2012	Corn	9.4	228,253	Holding Pond	70	84	123	108
			2013	Corn	0.0	0	Holding Pond	0	0	0	177
2			2014	Corn	9.4	228,253	Holding Pond	70	84	123	117
562	R/C 4.9	4.9	2009	Corn							
			2010	Corn	0.0	0	Holding Pond	0	0	0	197
1970			2011	Corn	0.0	0	Holding Pond	0	0	0	197
			2012	Corn	9.4	46,217	Holding Pond	70	84	123	127
			2013	Corn	0.0	0	Holding Pond	0	0	0	187
15			2014	Corn	9.4	46,060	Holding Pond	69	84	123	122
0	(b) (6)	61.4	2009	Corn							
			2010	Corn	21.3	1,307,820	Holding Pond	285	285	320	-88
0			2011	Corn	21.3	1,306,549	Holding Pond	157	189	278	0
			2012	Corn	18.6	1,140,759	Holding Pond	137	165	242	0
			2013	Corn	17.9	1,099,979	Holding Pond	132	159	234	0
0			2014	Corn	17.8	1,089,949	Holding Pond	131	158	232	0

**Summary of Manure Applications continued**

Applications are entered for the crop year (i.e. 2008 applications are applied in Fall 2007 - Spring 2008 for 2008 crop)

FSA Tract #	Field Name	Acres Available for Application	Year	Crop	Planned Manure (1000 gal)	Planned Manure (total gal)	Manure Source	Planned N Applied lbs/ac	Planned P Applied lbs/ac	Planned K Applied lbs/ac	Commercial N Needed (lbs/ac)
0	(b) (6) 76.1	76.1	2009	Corn							
			2010	Corn	24.1	1,834,010	Holding Pond	322	322	362	-125
0			2011	Corn	20.6	1,565,226	Holding Pond	152	183	268	0
			2012	Corn	18.4	1,400,558	Holding Pond	136	164	240	0
0			2013	Corn	17.9	1,360,055	Holding Pond	132	159	233	0
			2014	Corn	13.1	1,000,000	Holding Pond	97	117	171	34
0	(b) (6) 56.4	56.4	2009	Corn							
			2010	Corn	21.8	1,229,520	Holding Pond	161	161	194	36
0			2011	Corn	21.2	1,192,989	Holding Pond	156	188	276	0
			2012	Corn	18.5	1,000,000	Holding Pond	137	165	242	0
0			2013	Corn	17.9	1,009,971	Holding Pond	132	159	234	0
			2014	Corn	17.7	1,001,084	Holding Pond	131	158	232	0
0	(b) (6) 4.9	4.9	2009	Corn							
			2010	Corn	20.0	98,000	Holding Pond	268	268	300	-71
0			2011	Corn	21.6	105,887	Holding Pond	160	192	282	0
			2012	Corn	18.7	91,436	Holding Pond	138	166	244	0
0			2013	Corn	17.9	87,881	Holding Pond	132	159	234	0
			2014	Corn	0.0	0	Holding Pond	0	0	0	131
0	(b) (6)	24.5	2009	Corn							
			2010	Corn	28.2	690,900	Holding Pond	377	377	423	-180
0			2011	Corn	19.5	478,399	Holding Pond	144	174	255	0
			2012	Corn	18.1	444,626	Holding Pond	134	161	237	0
0			2013	Corn	17.8	436,319	Holding Pond	131	158	232	0
			2014	Corn	17.7	434,275	Holding Pond	131	158	231	0

**Summary of Manure Applications continued**

Applications are entered for the crop year (i.e. 2008 applications are applied in Fall 2007 - Spring 2008 for 2008 crop)

FSA Tract #	Field Name	Acres Available for Application	Year	Crop	Planned Manure (1000 gal)	Planned Manure (total gal)	Manure Source	Planned N Applied lbs/ac	Planned P Applied lbs/ac	Planned K Applied lbs/ac	Commercial N Needed (lbs/ac)
0	(b) (6) 35.7 & 24.5	60.11	2009	Corn							
			2010	Corn	25.6	1,538,816	Holding Pond	343	343	384	-146
0			2011	Corn	20.2	1,213,439	Holding Pond	149	179	263	0
			2012	Corn	18.3	1,100,641	Holding Pond	135	163	239	0
			2013	Corn	0.0	0	Holding Pond	0	0	0	132
0			2014	Corn	22.3	1,338,621	Holding Pond	164	198	291	0
0	R/C 135.3	142.74	2009	Corn							
			2010	Corn	25.8	3,682,692		345	345	387	-148
0			2011	Corn	20.1	1,500,000	Holding Pond	148	179	262	0
			2012	Corn	18.3	1,500,000	Holding Pond	135	163	239	0
			2013	Corn	17.8	2,547,634	Holding Pond	132	159	233	0
0			2014	Corn	17.7	2,526,498	Holding Pond	131	157	231	0
0	(b) (6) 40	24.64	2009	Corn							
			2010	Corn	0.0	0	Holding Pond	0	0	0	197
0			2011	Corn	9.4	232,403	Holding Pond	70	84	123	127
			2012	Corn	9.4	232,403	Holding Pond	70	84	123	117
			2013	Corn	9.4	232,403	Holding Pond	70	84	123	112
0			2014	Corn	9.4	232,403	Holding Pond	70	84	123	109
0	(b) (6) 120	85.31	2009	Corn							
			2010	Corn	0.0	0	Holding Pond	0	0	0	197
0			2011	Corn	9.4	804,639	Holding Pond	70	84	123	127
			2012	Corn	9.4	804,639	Holding Pond	70	84	123	117
			2013	Corn	9.4	804,639	Holding Pond	70	84	123	112
0			2014	Corn	9.4	804,639	Holding Pond	70	84	123	109

**Summary of Manure Applications continued**

Applications are entered for the crop year (i.e. 2008 applications are applied in Fall 2007 - Spring 2008 for 2008 crop)

FSA Tract #	Field Name	Acres Available for Application	Year	Crop	Planned Manure (1000 gal)	Planned Manure (total gal)	Manure Source	Planned N Applied lbs/ac	Planned P Applied lbs/ac	Planned K Applied lbs/ac	Commercial N Needed (lbs/ac)
0	(b) (6) 80	47.31	2009	Corn							
			2010	Corn	0.0	0	Holding Pond	0	0	0	197
0			2011	Corn	9.4	446,225	Holding Pond	70	84	123	127
			2012	Corn	9.4	446,225	Holding Pond	70	84	123	117
			2013	Corn	9.4	446,225	Holding Pond	70	84	123	112
0			2014	Corn	9.4	446,225	Holding Pond	70	84	123	109
0	(b) (6) 80 South	66.94	2009	Corn							
			2010	Corn	0.0	0	Holding Pond	0	0	0	197
0			2011	Corn	9.4	631,374	Holding Pond	70	84	123	127
			2012	Corn	9.4	631,374	Holding Pond	70	84	123	117
			2013	Corn	9.4	631,374	Holding Pond	70	84	123	112
0			2014	Corn	9.4	631,374	Holding Pond	70	84	123	109
0	(b) (6) 25	22.91	2009	Corn							
			2010	Corn	0.0	0	Holding Pond	0	0	0	197
0			2011	Corn	0.0	0	Holding Pond	0	0	0	197
			2012	Corn	9.4	216,086	Holding Pond	70	84	123	127
			2013	Corn	9.4	216,086	Holding Pond	70	84	123	117
0			2014	Corn	9.4	216,086	Holding Pond	70	84	123	112
0	(b) (6) 15	15.39	2009	Corn							
			2010	Corn	0.0	0	Holding Pond	0	0	0	197
0			2011	Corn	0.0	0	Holding Pond	0	0	0	197
			2012	Corn	0.0	0	Holding Pond	0	0	0	197
			2013	Corn	9.4	145,158	Holding Pond	70	84	123	127
0			2014	Corn	9.4	145,158	Holding Pond	70	84	123	117

**Summary of Manure Applications continued**

Applications are entered for the crop year (i.e. 2008 applications are applied in Fall 2007 - Spring 2008 for 2008 crop)

FSA Tract #	Field Name	Acres Available for Application	Year	Crop	Planned Manure (1000 gal)	Planned Manure (total gal)	Manure Source	Planned N Applied lbs/ac	Planned P Applied lbs/ac	Planned K Applied lbs/ac	Commercial N Needed (lbs/ac)
0	(b) (6) 90	83.43	2009	Corn							
			2010	Corn	21.5	1,793,745	Holding Pond	159	159	191	38
0			2011	Corn	9.4	786,907	Holding Pond	70	84	123	104
			2012	Corn	9.4	786,907	Holding Pond	70	84	123	105
			2013	Corn	9.4	786,907	Holding Pond	70	84	123	106
0			2014	Corn	9.4	786,907	Holding Pond	70	84	123	106
0	(b) (6) 50	39.64	2009	Corn							
			2010	Corn	0.0	0	Holding Pond	0	0	0	197
0			2011	Corn	9.4	373,882	Holding Pond	70	84	123	127
			2012	Corn	9.4	373,882	Holding Pond	70	84	123	117
			2013	Corn	9.4	373,882	Holding Pond	70	84	123	112
0			2014	Corn	9.4	373,882	Holding Pond	70	84	123	109
0	(b) (6) 160	133.49	2009	Corn							
			2010	Corn	12.9	1,722,021	Holding Pond	95	95	115	102
0			2011	Corn	9.4	1,254,806	Holding Pond	69	84	123	113
			2012	Corn	9.4	1,259,070	Holding Pond	70	84	123	110
			2013	Corn	9.4	1,259,070	Holding Pond	70	84	123	108
0			2014	Corn	9.4	1,259,070	Holding Pond	70	84	123	108
0	(b) (6)	39.72	2009	Corn							
			2010	Corn	0.0	0	Holding Pond	0	0	0	197
0			2011	Corn	9.4	374,637	Holding Pond	70	84	123	127
			2012	Corn	9.4	374,637	Holding Pond	70	84	123	117
			2013	Corn	9.4	374,637	Holding Pond	70	84	123	112
0			2014	Corn	9.4	374,637	Holding Pond	70	84	123	109

**Summary of Manure Applications continued**

*Applications are entered for the crop year (i.e. 2008 applications are applied in Fall 2007 - Spring 2008 for 2008 crop)*

FSA Tract #	Field Name	Acres Available for Application	Year	Crop	Planned Manure (1000 gal)	Planned Manure (total gal)	Manure Source	Planned N Applied lbs/ac	Planned P Applied lbs/ac	Planned K Applied lbs/ac	Commercial N Needed (lbs/ac)
0	(b) (6) 160	147.94	2009	Corn							
			2010	Corn	0.0	0	Holding Pond	0	0	0	197
0			2011	Corn	9.4	1,395,362	Holding Pond	70	84	123	127
			2012	Corn	9.4	1,395,362	Holding Pond	70	84	123	117
			2013	Corn	9.4	1,395,362	Holding Pond	70	84	123	112
0			2014	Corn	9.4	1,395,362	Holding Pond	70	84	123	109
0	(b) (6) 95	77.03	2009	Corn							
			2010	Corn	0.0	0	Holding Pond	0	0	0	0
			2011	Corn	9.4	726,543	Holding Pond	70	84	123	127
			2012	Corn	9.4	726,543	Holding Pond	70	84	123	117
			2013	Corn	9.4	726,543	Holding Pond	70	84	123	112
0			2014	Corn	9.4	726,543	Holding Pond	70	84	123	109

**Projected Soil P & K Levels**  
**Rancho Cantera LLC**

Field Name	Acres	Current Soil Test		Change in Test		Projected Soil Test		Time to Reach 300 lbs/ac
		P	K	P	K	P	K	
R/C 116	112.33	257	787	0	68	257	855	--
R/C 19.1	19.06	321.5	964.5	-9	38	312	1002	--
R/C 40	41.76	119.5	463.5	22	141	141	604	33
R/C 8.1	8.1	92	355	25	151	117	506	33
R/C 2.5	2.5	590	1357	-19	7	571	1364	--
R/C 24.2	24.2	50	234	-9	38	41	272	--
R/C 4.9	4.9	--	--	0	55	--	--	--
(b) (6)	61.4	72.1	348	37	192	109	540	24
(b) (6)	76.1	40	177	32	174	72	351	33
(b) (6)	56.4	54	204	37	191	91	395	26
(b) (6)	4.9	151	366	20	135	171	501	29
(b) (6)	24.5	61	220	35	184	96	404	27
(b) (6)	60.11	151	366	23	144	174	510	26
(b) (6)	142.74	99.4	330	36	187	135	517	22
(b) (6)	24.64	--	--	0	68	--	--	--
(b) (6)	85.31	--	--	0	68	--	--	--
(b) (6)	47.31	--	--	-9	38	--	--	--
(b) (6)	66.94	--	--	-9	38	--	--	--
(b) (6)	22.91	--	--	-9	38	--	--	--
(b) (6)	15.39	--	--	-9	38	--	--	--
(b) (6)	83.43	--	--	0	68	--	--	--
(b) (6)	39.64	--	--	0	68	--	--	--
(b) (6)	133.49	--	--	-9	38	--	--	--
(b) (6)	39.72	--	--	0	68	--	--	--
(b) (6)	147.94	--	--	-9	38	--	--	--
(b) (6)	77.03	--	--	0	65	--	--	--

Change in Soil Test = Crop uptake for 2007-2010 - Nutrients applied to field for 2007-2010 in manure  
 9 lbs P required to change soil test 1 lb  
 4 lbs K required to change soil test 1 lb

Projected levels are based on planned crop rotations and planned manure applications.



Rancho Cantera LLC  
Supplemental Nutrients  
Crop Year 2011

Recommended Supplemental Nutrients if No Manure is Applied

Field Name	Acres	Crop	Yield	lbs N/ac	lbs P2O5 for Maintenance	lbs P2O5 for Buildup *	lbs K2O for Maintenance	lbs K2O for Buildup **
R/C 116	117.6	Corn	195	197	0	0	0	0
R/C 19.1	22.86	Corn	195	197	0	0	0	0
R/C 40	44.36	Corn	195	197	0	0	0	0
R/C 8.1	10.3	Corn	195	197	0	0	55	0
R/C 2.5	5.1	Corn	195	197	0	0	0	0
R/C 24.2	24.9	Corn	195	197	84	0	55	26
R/C 4.9	5.6	Corn	195	197	0	0	0	0
(b) (6)	68.4	Corn	195	197	0	0	55	0
(b) (6)	76.1	Corn	195	197	84	11	55	83
(b) (6)	58.3	Corn	195	197	84	0	55	56
(b) (6)	10.5	Corn	195	197	0	0	0	0
(b) (6)	31.5	Corn	195	197	84	0	55	40
(b) (6)	81.25	Corn	195	197	0	0	0	0
(b) (6)	142.7	Corn	195	197	0	0	55	0
(b) (6)	35.64	Corn	195	197	0	0	0	0
(b) (6)	107.2	Corn	195	197	0	0	0	0
(b) (6)	62.31	Corn	195	197	0	0	0	0
(b) (6)	68.24	Corn	195	197	0	0	0	0
(b) (6)	29.01	Corn	195	197	0	0	0	0
(b) (6)	17.49	Corn	195	197	0	0	0	0
(b) (6)	83.43	Corn	195	197	0	0	0	0
(b) (6)	40.64	Corn	195	197	0	0	0	0
(b) (6)	134.7	Corn	195	197	0	0	0	0
(b) (6)	40.72	Corn	195	197	0	0	0	0
(b) (6)	147.9	Corn	195	197	0	0	0	0
(b) (6)	78.93	Corn	195	197	0	0	0	0

\* Buildup is based on buildup applications applied over a 4 year period. So, buildup = (9(Desired soil test - Actual soil test))/4

\*\* Buildup is based on buildup applications applied over a 4 year period. So, buildup = (4(Desired soil test - Actual soil test))/4

Rancho Cantera LLC  
Supplemental Nutrients  
Crop Year 2012

Recommended Supplemental Nutrients if No Manure is Applied

Field Name	Acres	Crop	Yield	lbs N/ac	lbs P2O5 for Maintenance	lbs P2O5 for Buildup *	lbs K2O for Maintenance	lbs K2O for Buildup **
R/C 116	117.6	Corn	195	197	0	0	0	0
R/C 19.1	22.86	Corn	195	197	0	0	0	0
R/C 40	44.36	Corn	195	197	0	0	0	0
R/C 8.1	10.3	Corn	195	197	0	0	55	0
R/C 2.5	5.1	Corn	195	197	0	0	0	0
R/C 24.2	24.9	Corn	195	197	84	0	55	26
R/C 4.9	5.6	Corn	195	197	0	0	0	0
(b) (6)	68.4	Corn	195	197	0	0	55	0
(b) (6)	76.1	Corn	195	197	84	11	55	83
(b) (6)	58.3	Corn	195	197	84	0	55	56
(b) (6)	10.5	Corn	195	197	0	0	0	0
(b) (6)	31.5	Corn	195	197	84	0	55	40
(b) (6)	81.25	Corn	195	197	0	0	0	0
(b) (6)	142.7	Corn	195	197	0	0	55	0
(b) (6)	35.64	Corn	195	197	0	0	0	0
(b) (6)	107.2	Corn	195	197	0	0	0	0
(b) (6)	62.31	Corn	195	197	0	0	0	0
(b) (6)	68.24	Corn	195	197	0	0	0	0
(b) (6)	29.01	Corn	195	197	0	0	0	0
(b) (6)	17.49	Corn	195	197	0	0	0	0
(b) (6)	83.43	Corn	195	197	0	0	0	0
(b) (6)	40.64	Corn	195	197	0	0	0	0
(b) (6)	134.7	Corn	195	197	0	0	0	0
(b) (6)	40.72	Corn	195	197	0	0	0	0
(b) (6)	147.9	Corn	195	197	0	0	0	0
(b) (6)	78.93	Corn	195	197	0	0	0	0

\* Buildup is based on buildup applications applied over a 4 year period. So, buildup = (9(Desired soil test - Actual soil test))/4

\*\* Buildup is based on buildup applications applied over a 4 year period. So, buildup = (4(Desired soil test - Actual soil test))/4

Rancho Cantera LLC  
Supplemental Nutrients  
Crop Year 2013

Recommended Supplemental Nutrients if No Manure is Applied

Field Name	Acres	Crop	Yield	lbs N/ac	lbs P2O5 for Maintenance	lbs P2O5 for Buildup *	lbs K2O for Maintenance	lbs K2O for Buildup **
R/C 116	117.6	Corn	195	197	0	0	0	0
R/C 19.1	22.86	Corn	195	197	0	0	0	0
R/C 40	44.36	Corn	195	197	0	0	0	0
R/C 8.1	10.3	Corn	195	197	0	0	55	0
R/C 2.5	5.1	Corn	195	197	0	0	0	0
R/C 24.2	24.9	Corn	195	197	84	0	55	26
R/C 4.9	5.6	Corn	195	197	0	0	0	0
(b) (6)	68.4	Corn	195	197	0	0	55	0
	76.1	Corn	0	197	84	11	55	83
	58.3	Corn	195	197	84	0	55	56
	10.5	Corn	195	197	0	0	0	0
	31.5	Corn	195	197	84	0	55	40
	81.25	Corn	195	197	0	0	0	0
	142.7	Corn	195	197	0	0	55	0
	35.64	Corn	195	197	0	0	0	0
	107.2	Corn	195	197	0	0	0	0
	62.31	Corn	195	197	0	0	0	0
	68.24	Corn	195	197	0	0	0	0
	29.01	Corn	195	197	0	0	0	0
	17.49	Corn	195	197	0	0	0	0
	83.43	Corn	195	197	0	0	0	0
	40.64	Corn	195	197	0	0	0	0
	134.7	Corn	195	197	0	0	0	0
	40.72	Corn	195	197	0	0	0	0
	147.9	Corn	195	197	0	0	0	0
	78.93	Corn	195	197	0	0	0	0

\* Buildup is based on buildup applications applied over a 4 year period. So, buildup =(9(Desired soil test - Actual soil test))/4

\*\* Buildup is based on buildup applications applied over a 4 year period. So, buildup = (4(Desired soil test - Actual soil test))/4

Rancho Cantera LLC  
Supplemental Nutrients  
Crop Year 2014

Recommended Supplemental Nutrients if No Manure is Applied

Field Name	Acres	Crop	Yield	lbs N/ac	lbs P2O5 for Maintenance	lbs P2O5 for Buildup *	lbs K2O for Maintenance	lbs K2O for Buildup **
R/C 116	117.6	Corn	195	197	0	0	0	0
R/C 19.1	22.86	Corn	195	197	0	0	0	0
R/C 40	44.36	Corn	195	197	0	0	0	0
R/C 8.1	10.3	Corn	195	197	0	0	55	0
R/C 2.5	5.1	Corn	195	197	0	0	0	0
R/C 24.2	24.9	Corn	195	197	84	0	55	26
R/C 4.9	5.6	Corn	195	197	0	0	0	0
(b) (6)	68.4	Corn	195	197	0	0	55	0
	76.1	Corn	195	197	84	11	55	83
	58.3	Corn	195	197	84	0	55	56
	10.5	Corn	195	197	0	0	0	0
	31.5	Corn	195	197	84	0	55	40
	81.25	Corn	195	197	0	0	0	0
	142.7	Corn	195	197	0	0	55	0
	35.64	Corn	195	197	0	0	0	0
	107.2	Corn	195	197	0	0	0	0
	62.31	Corn	195	197	0	0	0	0
	68.24	Corn	195	197	0	0	0	0
	29.01	Corn	195	197	0	0	0	0
	17.49	Corn	195	197	0	0	0	0
	83.43	Corn	195	197	0	0	0	0
	40.64	Corn	195	197	0	0	0	0
	134.7	Corn	195	197	0	0	0	0
	40.72	Corn	195	197	0	0	0	0
	147.9	Corn	195	197	0	0	0	0
	78.93	Corn	195	197	0	0	0	0

\* Buildup is based on buildup applications applied over a 4 year period. So, buildup =  $(9(\text{Desired soil test} - \text{Actual soil test}))/4$

\*\* Buildup is based on buildup applications applied over a 4 year period. So, buildup =  $(4(\text{Desired soil test} - \text{Actual soil test}))/4$

## Value of Manure Compared to Fertilizer

### Commercial Fertilizer

Market Value as of April 1,2008

Nitrogen	Price per Ton	Price per pound of N
Anhydrous Ammonia (NH <sub>3</sub> )	\$795	\$0.48
Liquid 28% (28%N)	\$380	\$0.68

Phosphorus	Price per Ton	Price per pound of P <sub>2</sub> O <sub>5</sub>	Price per pound of N
DAP (18-46-0)	\$1,100	\$1.20	\$3.06

Potassium	Price per Ton	Price per pound of K <sub>2</sub> O
Potash (0-0-60)	\$700	\$0.58

*\*Price does not include application cost.*

### What is the value of Manure generated by the farm?

<i>price per 1000 gal for liquid manure and price per ton for solid manure, based upon average market value of comercial fertilizer</i>			
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Holding Pond	\$10.65	\$10.64	\$7.64

Facilty	Manure Produced (gallons)	Value of Manure Based on N	Value of Manure Based on P <sub>2</sub> O <sub>5</sub>
Holding Pond	16,418,739	\$174,841.20	\$174,716.80
<b>Total</b>		<b>\$174,841.20</b>	<b>\$174,716.80</b>

### Manure

Analysis estimates from Midwest Plan Service

	Total N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
<i>Dairy</i>	<i>lbs/1000 gal raw waste</i>		
<b>Holding Pond</b>	<b>18.4</b>	<b>8.9</b>	<b>13.1</b>

**Field Inventory**  
**Rancho Cantera LLC**

**Crop Rotations & Expected Yields**  
**bu/acre or tons/acre**

FSA Farm #	FSA Tract #	FSA Field #	County	Township	Sect #	Field Name	Acres	N/A Acres	Acres for App	Soil Type	Hydric Soil Class	P TEST	K TEST	2009	2010	2011	2012	2013	2014
562	1970	14	Stephenson	Kent	15	R/C 116	117.6	5.3	112.3	675B Greenbush silt loam	B	257	787	Corn	Corn	Corn	Corn	Corn	Corn
562	1970	5	Stephenson	Kent	15	R/C 19.1	22.9	3.8	19.1	280C2 Fayette silt loam	B	322	965	195	195	195	195	195	195
562	1970	7	Stephenson	Kent	14	R/C 40	44.4	2.6	41.8	735D2 Casco Rodman Fox Complex	B	120	464	195	195	195	195	195	195
562	1970	3	Stephenson	Kent	10	R/C 8.1	10.3	2.2	8.1	280C2 Fayette silt loam	B	92	355	195	195	195	195	195	195
562	1970	1	Stephenson	Kent	10	R/C 2.5	5.1	2.6	2.5	8451A Lawosn silt loam	C	590	1357	195	195	195	195	195	195
562	1970	2	Stephenson	Kent	10	R/C 24.2	24.9	0.7	24.2	280C2 Fayette silt loam	B	50	234	195	195	195	195	195	195
562	1970	15	Stephenson	Kent	15	R/C 4.9	5.6	0.7	4.9	429C2 Palsgrove silt loam	B	--	--	195	195	195	195	195	195
			Jo Daviess	Wards Grove	16	(b) (6)	68.4	7.0	61.4	675B Greenbush silt loam	B	72	348	195	195	195	195	195	195
			Stephenson	Kent	14	(b) (6)	76.1	0.0	76.1	280C2 Fayette silt loam	B	40	177	195	195	195	195	195	195
			Stephenson	Kent	14	(b) (6)	58.3	1.9	56.4	280C2 Fayette silt loam	B	54	204	195	195	195	195	195	195
			Stephenson	Kent	14	(b) (6)	10.5	5.6	4.9	280C2 Fayette silt loam	B	151	366	195	195	195	195	195	195
			Stephenson	Kent	14	(b) (6)	31.5	7.0	24.5	280C2 Fayette silt loam	B	61	220	195	195	195	195	195	195
			Stephenson	Kent	13	(b) (6)	81.3	21.1	60.1	8451A Lawosn silt loam	C	151	366	195	195	195	195	195	195
			Stephenson	Kent	13	R/C 135.3	142.7	0.0	142.7	280C2 Fayette silt loam	B	99	330	195	195	195	195	195	195
			Jo Daviess	Wards Grove	16	(b) (6)	35.6	11.0	24.6	279B Rozetta silt loam	B	--	--	195	195	195	195	195	195
			Stephenson	Kent	15	(b) (6)	120	21.9	85.3	675C2 Greenbush silt loam	B	--	--	195	195	195	195	195	195
			Stephenson	Kent	15	(b) (6)	80	62.3	15.0	47.3	675B Greenbush silt loam	B	--	--	195	195	195	195	195
			Stephenson	Kent	23	(b) (6)	68.2	1.3	66.9	675C2 Greenbush silt loam	B	--	--	195	195	195	195	195	195
			Stephenson	Kent	14	(b) (6)	5	29.0	6.1	22.9	8451A Lawosn silt loam	B	--	--	195	195	195	195	195
			Stephenson	Kent	14	(b) (6)	15	17.5	2.1	15.4	279B Rozetta silt loam	B	--	--	195	195	195	195	195
			Jo Daviess	Wards Grove	9	(b) (6)	90	83.4	0.0	83.4	419C2 Flagg silt loam	B	--	--	195	195	195	195	195

Field E

Flicking Farm  
Barn  
North

Dyers West  
Grinder Stone Farm

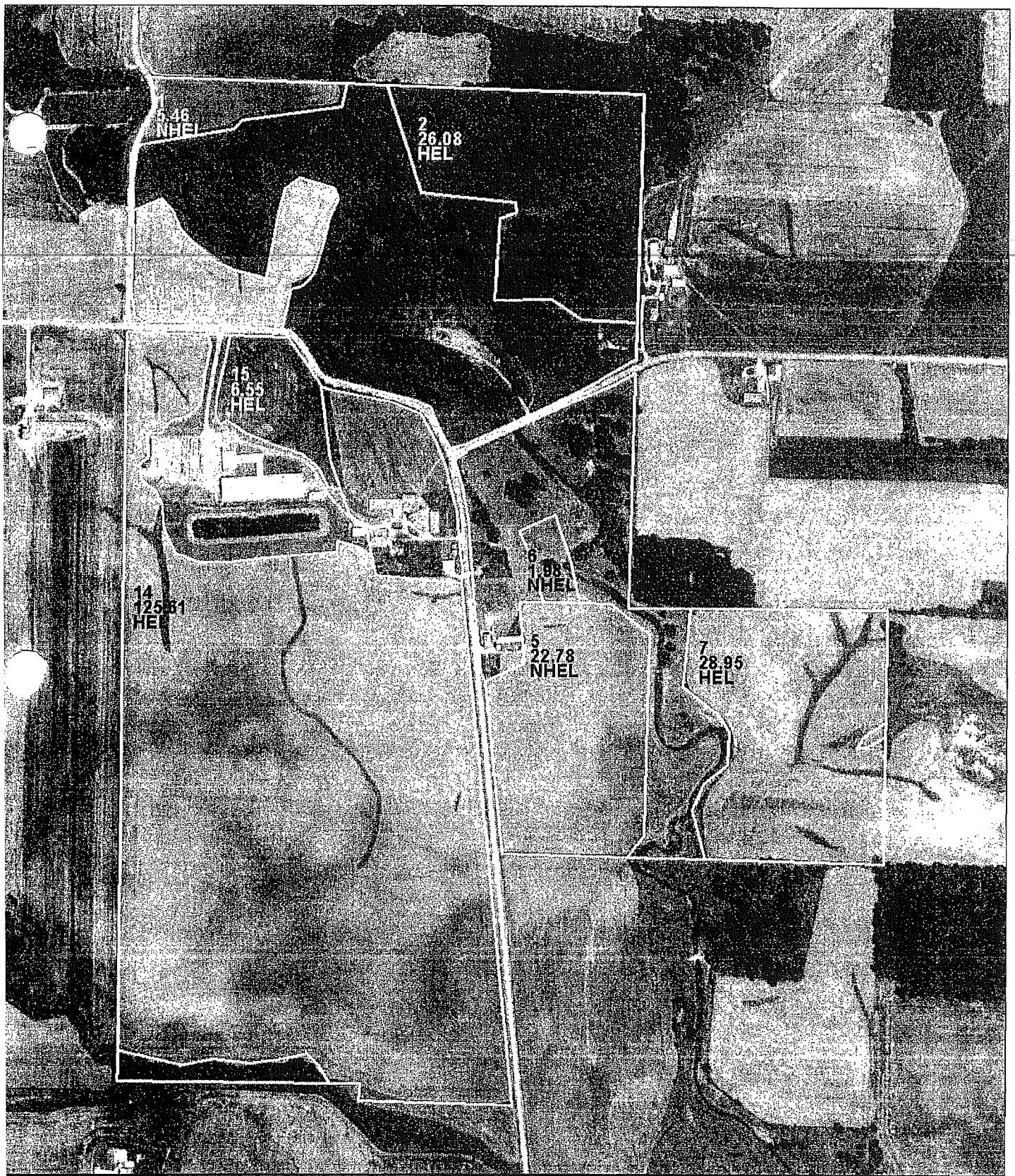
**Field Inventory**  
**Rancho Cantera LLC**

**Crop Rotations & Expected Yields**  
**bu/acre or tons/acre**

FSA Farm #	FSA Tract #	FSA Field #	County	Township	Sect #	Field Name	Acres	N/A Acres	Acres for App	Soil Type	Hydric Soil Class	P TEST	K TEST	2009	2010	2011	2012	2013	2014
			Stephenson	Kent	15	(b) 50	40.6	1.0	39.6	419C2 Flagg silt loam	B	--	--	Corn	Corn	Corn	Corn	Corn	Corn
														195	195	195	195	195	195
			Jo Daviess	Wards Grove	16	(b) 60	134.7	1.2	133.5	419C2 Flagg silt loam	B	--	--	Corn	Corn	Corn	Corn	Corn	Corn
														195	195	195	195	195	195
			Jo Daviess	Wards Grove	9	(b) 40	40.7	1.0	39.7	279B Rozetta silt loam	B	--	--	Corn	Corn	Corn	Corn	Corn	Corn
														195	195	195	195	195	195
			Jo Daviess	Wards Grove	8	(b) 160	147.9	0.0	147.9	61B Atterberry silt loam	B	--	--	Corn	Corn	Corn	Corn	Corn	Corn
														195	195	195	195	195	195
			Jo Daviess	Wards Grove	2	(b) (6) 95	78.9	1.9	77.0	279B Rozetta silt loam	B	--	--	Corn	Corn	Corn	Corn	Corn	Corn
														195	195	195	195	195	195
							1545.8		1422.8										

Corn Acres (previous year Beans)		0	0	0	0	0
Corn Acres (previous year not Beans)		1,423	1,423	1,423	1,423	1,423
Bean Acres		0	0	0	0	0
Wheat Acres		0	0	0	0	0
Alfalfa Acres		0	0	0	0	0
Grass Acres		0	0	0	0	0
Total		1,423	1,423	1,423	1,423	1,423





Farm: 562  
Tract: 1970

0 400 800 1200 1600 Feet



Scale 1:7920

This map is for FSA program purposes only.

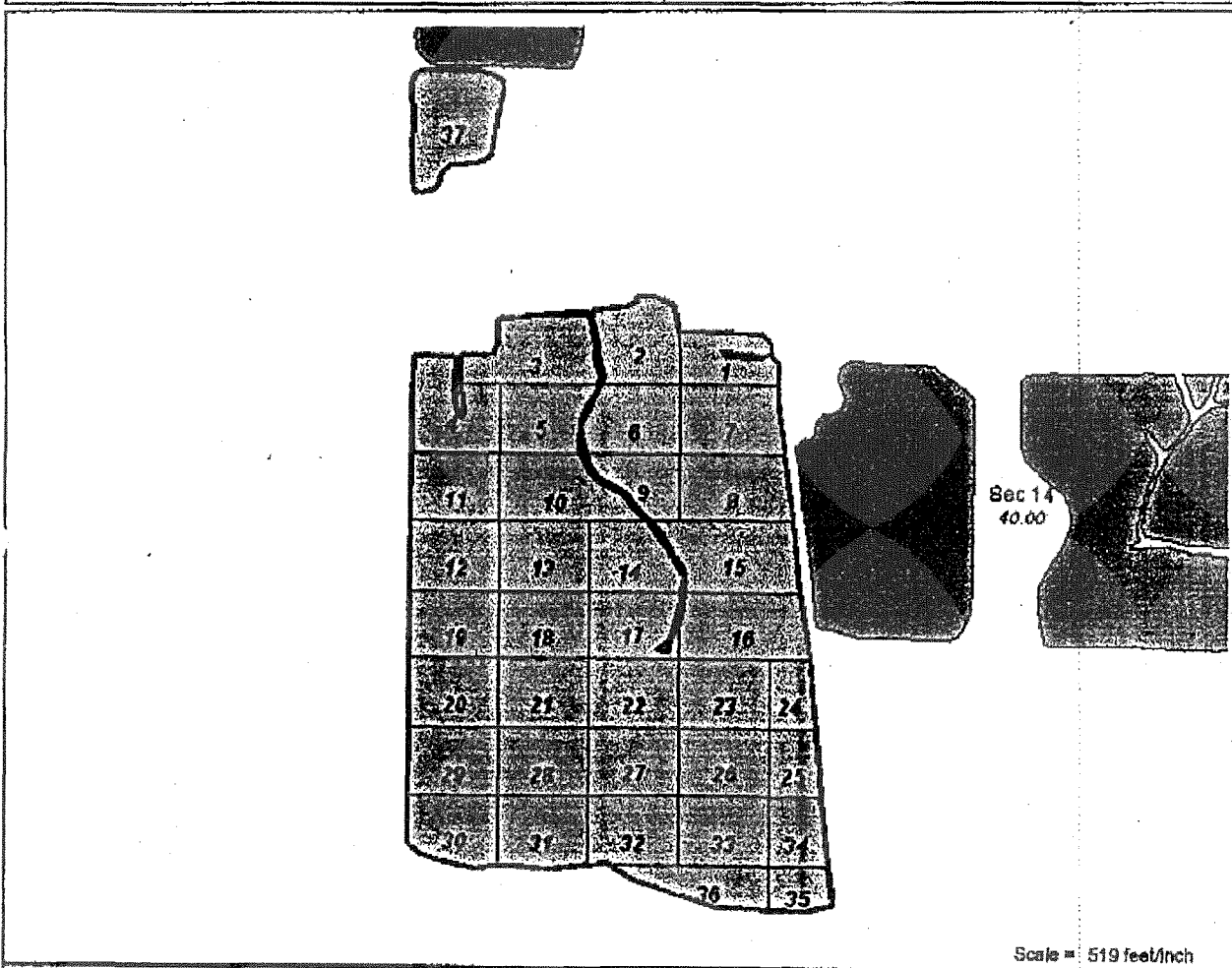
Clu\_a\_11177.shp

Printed: Dec 5, 2007

# Rancho Cantera LLC

## SampleID

<b>Prepared For:</b> Rancho Cantera LLC	<b>County:</b> Stephenson, IL
<b>Farm:</b> Dairy Farm	<b>Twp Rng Sec:</b> Kent 15
<b>Field:</b> Sec 15	<b>Directions:</b> W Klass Rd
<b>Crop Zone:</b>	<b>Prepared By:</b> GMS Laboratories
<b>Crop Year:</b>	<b>Acres:</b> 217.00



Layer Summary	
<b>Layer:</b> 2008 Soil Test Regions	
<b>Attribute:</b> SampleID	
<b>Acres:</b>	118.46
<b>Average:</b>	
<b>Weighted Average:</b>	
<b>Minimum:</b>	
<b>Maximum:</b>	

South of Parry  
Field A

# Rancho Cantera LLC

## Soil Test Results

Prepared For: Rancho Cantera LLC				County: Stephenson, IL	
Farm: Dairy Farm				Twp-Rng Sec: Kent 15	
Field: Sec 15				Directions: W Klass Rd	
Crop Zone:				Prepared By: GMS Laboratories	
Crop Year:				Acres: 217.00	

Layer Name: 2008 Soil Test Regions

Date Sampled: June 19, 2008

SampleID	LabID	pH	BpH	P1	K	OM	H	CEC	Ca	Mg	S	Zn	Cu
	none	none	none	LbsPerAcre	LbsPerAcre	%	meq/100g	meq/100g	LbsPerAcre	LbsPerAcre	ppm	ppm	ppm
1		6.9	7.0	134	392	2.0		15.4	4097	1125	32	9.1	2.7
2		6.8	7.0	182	797	2.0		16.3	3895	1324	34	7.7	4.8
3		6.7	7.0	245	1310	2.5		19.0	4548	1433	39	11.8	6.1
4		7.0	7.0	252	1237	3.5		18.6	4649	1297	42	13.3	7.2
5		7.1	7.0	285	1295	3.5		21.3	5243	1561	47	9.2	6.1
6		6.8	7.0	329	1636	3.5		20.6	5124	1366	42	14.1	7.5
7		6.9	7.0	344	1604	2.5		20.3	4786	1508	41	12.7	8.4
8		6.8	7.0	225	725	2.5		23.3	5531	2046	45	8.8	7.3
9		7.0	7.0	190	556	2.5		19.8	4988	1599	39	9.1	5.9
10		7.0	7.0	208	738	2.5		21.3	5431	1618	42	11.4	8.3
11		7.1	7.0	257	839	4.5		28.2	7562	1978	51	11.2	6.8
12		6.9	7.0	162	515	4.5		24.1	6378	1791	48	7.1	4.2
13		7.0	7.0	143	417	4.5		21.8	5848	1584	44	8.0	4.0
14		6.6	7.0	121	618	4.5		21.4	5559	1617	40	6.4	4.3
15		6.7	7.0	185	735	3.5		22.1	5521	1769	42	9.1	7.9
16		6.8	7.0	129	526	3.5		18.5	4639	1489	42	7.4	5.9
17		7.1	7.0	155	600	3.5		17.9	4678	1305	38	9.1	5.2
18		6.9	7.0	154	649	4.5		19.1	4892	1439	34	8.8	6.8
19		6.6	7.0	165	540	4.5		21.1	5413	1661	41	7.0	4.1
20		6.8	7.0	157	517	4.5		18.7	4847	1419	39	9.8	5.6
21		6.9	7.0	162	587	4.5		18.6	4416	1624	36	6.4	6.1
22		6.4	7.0	300	809	4.5		19.8	5199	1384	42	13.1	6.9
23		6.9	7.0	383	1002	4.5		20.2	5248	1398	38	15.0	6.3
24		7.0	7.0	374	1048	4.5		19.0	4967	1267	40	15.4	7.0
25		7.2	7.0	595	1200	4.5		30.8	8322	2024	51	21.9	8.4
26		7.3	7.0	575	1016	4.5		29.8	7828	2144	53	19.4	9.3
27		6.9	7.0	506	1215	4.5		29.2	7841	1924	47	18.3	7.0
28		6.8	7.0	408	760	4.5		32.5	8826	2271	56	16.4	7.4
29		6.4	7.0	368	944	4.5		23.2	6176	1582	44	15.4	6.8
30		6.9	7.0	151	694	4.5		19.3	4706	1592	39	8.2	6.0
31		7.0	7.0	300	787	4.5		22.2	5676	1688	38	10.8	7.7
32		6.7	7.0	302	626	4.5		23.8	6635	1543	42	13.7	7.5
33		7.1	7.0	327	688	4.5		24.9	6757	1704	48	15.7	8.2
34		7.0	7.0	471	890	4.5		28.0	7368	2015	51	17.4	9.0
35		7.2	7.0	610	1436	4.5		29.9	7601	2167	52	20.6	9.2
36		7.1	7.0	457	1114	4.5		31.1	8522	2000	52	17.3	7.6
37		7.0	7.0	534	1038	3.5		24.1	6407	1609	45	18.2	8.8

Average:	6.9	7.0	293	868	3.9	22.6	5841	1645	43	12.3	6.7
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$$P = 293$$

$$P_2O_5 = 67.4$$

$$K = 868$$

$$K_2O = 104.2$$



(b) (6)

## GMS Labs Soil Testing Report

Dealer: Independent Grower (#900100)

Client: (b) (6)

Farm: Rancho Cantera LLC

Field: Dairy Farm Sec 15

June 18, 2008

Work order #1622

File #: 148.1

No of samples: 37



GMS Laboratories, Inc.

23877 E. North Rd. PO Box 61

Cropsey, IL 61731

Ph: (309) 377-2851 Fax: (309) 377-2017

21	42860	6.9	162	587	4.5	7.0	4416	1624	0.0	18.6	4.1	59.5	38.5	0.0	36	6.4	148	243	6.1	1.1	163
22	42861	6.4	300	809	4.5	7.0	5199	1384	0.0	19.8	5.2	65.6	29.1	0.0	42	13.1	132	267	6.9	1.2	182
23	42862	6.9	383	1002	4.5	7.0	5248	1398	0.0	20.2	6.4	64.9	28.8	0.0	38	15.0	199	320	6.3	1.4	178
24	42863	7.0	374	1048	4.5	7.0	4967	1267	0.0	19.0	7.1	65.2	27.7	0.0	40	15.4	267	326	7.0	1.5	200
25	42864	7.2	595	1200	4.5	7.0	8322	2024	0.0	30.8	5.0	67.6	27.4	0.0	51	21.9	186	351	8.4	2.2	181
26	42865	7.3	575	1016	4.5	7.0	7828	2144	0.0	29.8	4.4	65.7	30.0	0.0	53	19.4	174	306	9.3	2.0	174
27	42866	6.9	506	1215	4.5	7.0	7841	1924	0.0	29.2	5.3	67.2	27.5	0.0	47	18.3	148	407	7.0	1.9	166
28	42867	6.8	408	760	4.5	7.0	8826	2271	0.0	32.5	3.0	67.9	29.1	0.0	56	16.4	132	374	7.4	1.9	188
29	42868	6.4	368	944	4.5	7.0	6176	1582	0.0	23.2	5.2	66.4	28.4	0.0	44	15.4	105	335	6.8	1.4	166
30	42869	6.9	151	694	4.5	7.0	4706	1582	0.0	19.3	4.6	61.0	34.4	0.0	39	8.2	195	248	6.0	1.3	180
31	42870	7.0	300	787	4.5	7.0	5676	1688	0.0	22.2	4.5	63.8	31.6	0.0	38	10.8	158	421	7.7	1.7	153
32	42871	6.7	302	626	4.5	7.0	6635	1543	0.0	23.8	3.4	69.6	27.0	0.0	42	13.7	179	361	7.5	1.7	182
33	42872	7.1	327	688	4.5	7.0	6757	1704	0.0	24.9	3.5	67.9	28.6	0.0	48	16.7	203	327	8.2	2.0	155
34	42873	7.0	471	890	4.5	7.0	7368	2015	0.0	28.0	4.1	65.9	30.0	0.0	51	17.4	134	461	9.0	2.4	203
35	42874	7.2	610	1435	4.5	7.0	7601	2167	0.0	29.9	6.2	63.6	30.2	0.0	52	20.6	181	494	9.2	2.4	183
36	42875	7.1	457	1114	4.5	7.0	8522	2000	0.0	31.1	4.6	68.6	28.8	0.0	52	17.3	213	449	7.6	2.1	195
37	42876	7.0	534	1038	3.5	7.0	6407	1609	0.0	24.1	5.5	66.6	27.9	0.0	45	18.2	201	481	8.8	2.1	166
Averages		6.9	293	868	3.9	7.0	5841	1645	0.0	22.6	5.0	64.4	30.6	0.0	43	12.3	164	306	6.7	1.6	185

\* OM reported using Color Card

(b) (6)

Nov-11-10 11:35AM;

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# GMS Labs Soil Testing Report

Dealer: Independent Grower (#900100)

Client: (b) (6)

Farm: Rancho Cantera LLC

Field: Dairy Farm Sec 15

June 18, 2008

Work order #:1622

File #: 148.1

No of samples: 37



GMS Laboratories, Inc.

23877 E. North Rd. PO Box 61

Cropsey, IL 61731

Ph: (309) 377-2851 Fax: (309) 377-2017

Smp#	Lab#	pH	P #/a	K #/a	OM *	BpH	Ca #/a	Mg #/a	meq/100g		Base Saturation				S ppm	Zn ppm	Mn ppm	Fe ppm	Cu ppm	B ppm	Na
									H	CEC	%K	%Ca	%Mg	%H							
1	42840	6.9	134	392	2.0	7.0	4097	1125	0.0	15.4	3.3	66.4	30.4	0.0	32	9.1	265	296	2.7	1.3	197
2	42841	6.8	182	797	2.0	7.0	3895	1324	0.0	16.3	6.3	59.8	33.9	0.0	34	7.7	208	308	4.8	1.4	145
3	42842	6.7	245	1310	2.5	7.0	4548	1433	0.0	19.0	8.8	59.8	31.4	0.0	39	11.8	195	288	6.1	1.4	198
4	42843	7.0	252	1237	3.5	7.0	4649	1297	0.0	18.6	8.5	62.4	29.0	0.0	42	13.3	191	244	7.2	1.3	196
5	42844	7.1	285	1295	3.5	7.0	5243	1561	0.0	21.3	7.8	61.6	30.6	0.0	47	9.2	181	414	6.1	1.8	206
6	42845	8.8	329	1636	3.5	7.0	5124	1366	0.0	20.6	10.2	62.2	27.6	0.0	42	14.1	142	275	7.5	1.5	217
7	42846	6.9	344	1604	2.5	7.0	4786	1508	0.0	20.3	10.1	58.9	30.9	0.0	41	12.7	178	270	8.4	1.6	194
8	42847	6.8	225	725	2.5	7.0	5531	2046	0.0	23.3	4.0	59.4	36.6	0.0	45	8.8	191	317	7.3	1.6	184
9	42848	7.0	190	556	2.5	7.0	4988	1599	0.0	19.8	3.6	62.8	33.6	0.0	39	9.1	176	238	5.9	1.4	191
10	42849	7.0	208	738	2.5	7.0	5431	1616	0.0	21.3	4.4	63.8	31.7	0.0	42	11.4	174	246	8.3	1.5	240
11	42850	7.1	257	839	4.5	7.0	7562	1978	0.0	28.2	3.8	67.0	29.2	0.0	51	11.2	100	259	6.8	1.7	202
12	42851	6.9	162	515	4.5	7.0	6378	1791	0.0	24.1	2.7	66.3	31.0	0.0	48	7.1	83	205	4.2	1.1	214
13	42852	7.0	143	417	4.5	7.0	5848	1584	0.0	21.8	2.5	67.2	30.3	0.0	44	8.0	144	244	4.0	1.3	218
14	42853	6.6	121	618	4.5	7.0	5559	1617	0.0	21.4	3.7	64.9	31.4	0.0	40	6.4	101	199	4.3	1.1	169
15	42854	6.7	185	735	3.5	7.0	5521	1769	0.0	22.1	4.3	62.4	33.3	0.0	42	9.1	122	232	7.9	1.4	203
16	42855	6.8	129	526	3.5	7.0	4639	1489	0.0	16.5	3.6	62.8	33.6	0.0	42	7.4	128	210	5.9	1.2	182
17	42856	7.1	155	600	3.5	7.0	4678	1305	0.0	17.9	4.3	65.3	30.4	0.0	38	9.1	195	233	5.2	1.4	149
18	42857	6.9	154	649	4.5	7.0	4892	1439	0.0	19.1	4.4	64.2	31.5	0.0	34	8.8	146	225	6.8	1.4	178
19	42858	6.6	165	540	4.5	7.0	5413	1661	0.0	21.1	3.3	64.0	32.7	0.0	41	7.0	89	223	4.1	1.1	155
20	42859	6.8	157	517	4.5	7.0	4847	1419	0.0	18.7	3.5	64.8	31.6	0.0	39	9.8	118	228	5.6	1.2	180

# GMS Labs Soil Testing Report

Dealer: Independent Grower (#900100)

Client: (b) (6)

Farm: Rancho Cantera LLC

Field: Dairy Farm Sec 15

June 18, 2008

Work order #1622

File #: 148.1

No of samples: 37



GMS Laboratories, Inc.

23877 E. North Rd. PO Box 61

Cropsey, IL 61731

Ph: (309) 377-2851 Fax: (309) 377-2017

21	42860	6.9	162	587	4.5	7.0	4416	1624	0.0	18.6	4.1	59.5	36.5	0.0	36	6.4	148	243	6.1	1.1	163
22	42861	6.4	300	809	4.5	7.0	5199	1384	0.0	19.8	5.2	65.6	29.1	0.0	42	13.1	132	267	6.9	1.2	182
23	42862	6.9	383	1002	4.5	7.0	5248	1398	0.0	20.2	6.4	64.9	28.8	0.0	38	15.0	199	320	6.3	1.4	178
24	42863	7.0	374	1048	4.5	7.0	4967	1267	0.0	19.0	7.1	65.2	27.7	0.0	40	15.4	267	326	7.0	1.5	200
25	42864	7.2	595	1200	4.5	7.0	8322	2024	0.0	30.8	5.0	67.6	27.4	0.0	51	21.9	186	351	8.4	2.2	181
26	42865	7.3	575	1016	4.5	7.0	7828	2144	0.0	29.8	4.4	65.7	30.0	0.0	53	19.4	174	306	9.3	2.0	174
27	42866	6.9	506	1215	4.5	7.0	7841	1924	0.0	29.2	5.3	67.2	27.5	0.0	47	18.3	148	407	7.0	1.9	166
28	42867	6.8	408	760	4.5	7.0	8826	2271	0.0	32.5	3.0	67.8	29.1	0.0	56	16.4	132	374	7.4	1.9	188
29	42868	6.4	368	944	4.5	7.0	6176	1582	0.0	23.2	5.2	66.4	28.4	0.0	44	15.4	105	335	6.8	1.4	166
30	42869	6.9	151	694	4.5	7.0	4706	1592	0.0	19.3	4.6	61.0	34.4	0.0	39	8.2	195	248	6.0	1.3	180
31	42870	7.0	300	787	4.5	7.0	5676	1688	0.0	22.2	4.5	63.8	31.6	0.0	38	10.8	158	421	7.7	1.7	153
32	42871	6.7	302	626	4.5	7.0	6635	1543	0.0	23.8	3.4	69.6	27.0	0.0	42	13.7	179	361	7.5	1.7	182
33	42872	7.1	327	688	4.5	7.0	6757	1704	0.0	24.9	3.5	67.9	28.5	0.0	48	15.7	203	327	8.2	2.0	155
34	42873	7.0	471	890	4.5	7.0	7368	2015	0.0	28.0	4.1	65.9	30.0	0.0	51	17.4	134	461	9.0	2.4	203
35	42874	7.2	610	1435	4.5	7.0	7601	2167	0.0	29.9	6.2	63.6	30.2	0.0	52	20.6	181	494	9.2	2.4	183
36	42875	7.1	457	1114	4.5	7.0	8522	2000	0.0	31.1	4.6	68.6	26.8	0.0	52	17.3	213	448	7.6	2.1	195
37	42876	7.0	534	1038	3.5	7.0	6407	1609	0.0	24.1	5.5	66.6	27.9	0.0	45	18.2	201	481	8.8	2.1	166

Averages	6.9	293	868	3.9	7.0	5841	1645	0.0	22.6	5.0	64.4	30.6	0.0	43	12.3	164	306	6.7	1.6	185
----------	-----	-----	-----	-----	-----	------	------	-----	------	-----	------	------	-----	----	------	-----	-----	-----	-----	-----

\* OM reported using Color Card

Sent By

(b) (6)

(b) (6)

Nov-11-10 11:36AM;

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# Rancho Cantera LLC

## SampleID

Prepared For: Rancho Cantera LLC

Farm: Dairy Farm

Field: Sec 14

Crop Zone:

Crop Year:

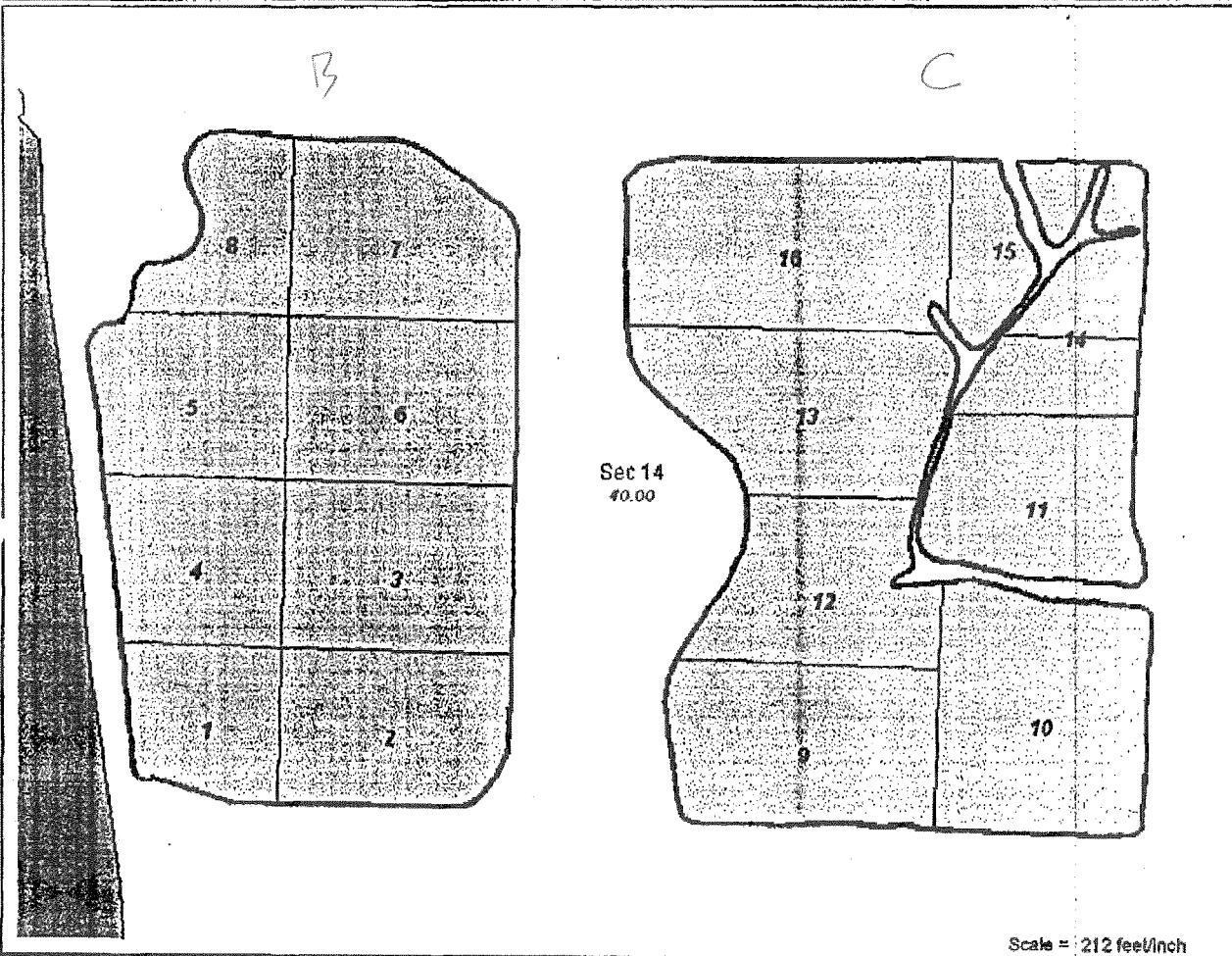
Acres: 40.00

County: Stephenson, IL

Twp Rng Sec: Kent 14

Directions:

Prepared By: GMS Laboratories



### Layer Summary

Layer: 2008 Soil Test Regions

Attribute: SampleID

Acres: 49.15

Average:

Weighted Average:

Minimum:

Maximum:

*East of Dairy*



# Rancho Cantera LLC

## Soil Test Results

<b>Prepared For:</b> Rancho Cantera LLC	<b>County:</b> Stephenson, IL
<b>Farm:</b> Dairy Farm	<b>Twp Rng Sec:</b> Kent 14
<b>Field:</b> Sec 14	<b>Directions:</b>
<b>Crop Zone:</b>	
<b>Crop Year:</b>	<b>Prepared By:</b> GMS Laboratories
<b>Acres:</b> 40.00	

Layer Name: 2008 Soil Test Regions

Date Sampled: June 19, 2008

SampleID	LabID	pH	BpH	P1	K	OM	H	CEC	Ca	Mg	S	Zn	Cu
	none	none	none	LbsPerAcre	LbsPerAcre	%	meq/100g	meq/100g	LbsPerAcre	LbsPerAcre	ppm	ppm	ppm
1		6.9	7.0	241	775	3.5		17.4	4437	1288	40	11.9	8.0
2		6.9	7.0	367	1254	4.5		20.2	5036	1449	45	11.0	7.7
3		6.8	7.0	480	1244	3.5		25.2	6558	1723	51	19.2	8.6
4		6.9	7.0	187	500	3.5		16.3	4213	1241	41	11.7	6.4
5		6.7	7.0	276	808	3.5		16.1	4010	1217	38	13.2	8.6
6		7.2	7.0	465	1121	4.5		17.8	4550	1186	38	20.4	6.0
7		7.0	7.0	492	1283	4.5		22.7	6007	1441	53	24.2	7.5
8		6.7	7.0	259	559	2.5		15.5	3862	1220	38	11.9	9.2
9		6.8	7.0	192	459	2.5		17.0	4574	1184	42	11.4	5.9
10		6.6	7.0	226	655	2.0		16.9	4240	1304	37	8.5	6.4
11		6.4	7.0	228	510	2.0		17.4	4322	1417	37	6.5	6.1
12		6.8	7.0	118	441	2.5		14.1	3685	1052	36	8.4	5.7
13		6.7	7.0	38	433	2.5		16.3	3955	1413	50	3.2	3.9
14		7.0	7.0	121	476	3.5		17.3	4520	1285	40	6.8	7.2
15		6.5	7.0	74	468	3.5		14.6	3644	1181	37	5.3	5.7
16		6.6	7.0	58	406	2.5		16.2	4068	1313	37	4.7	4.5
<b>Average:</b>		6.8	7.0	239	712	3.2		17.6	4479	1306	41	11.1	6.7

Field B

P = 346

K = 94.7

P<sub>2</sub>O<sub>5</sub> = 796K<sub>2</sub>O = 1132

Field C

P = 132

K = 48.1

P<sub>2</sub>O<sub>5</sub> = 303K<sub>2</sub>O = 577

# GMS Labs Soil Testing Report

Dealer: Independent Grower (#900100)

Client: (b) (6)

Farm: Rancho Cantera LLC

Field: Dairy Farm Sec 14

June 18, 2008

Work order #1621

File #: 148.1

No of samples: 16



GMS Laboratories, Inc.

23877 E. North Rd. PO Box 61

Cropsey, IL 61731

Ph: (309) 377-2851 Fax: (309) 377-2017

Smp#	Lab#	pH	P #/a	K #/a	OM *	BpH	Ca #/a	Mg #/a	meq/100g		Base Saturation				S ppm	Zn ppm	Mn ppm	Fe ppm	Cu ppm	B ppm	Na
									H	CEC	%K	%Ca	%Mg	%H							
1	42877	6.9	241	775	3.5	7.0	4437	1268	0.0	17.4	5.7	63.9	30.4	0.0	40	11.9	241	356	8.0	1.9	189
2	42878	6.9	367	1254	4.5	7.0	5036	1449	0.0	20.2	7.9	62.2	29.8	0.0	45	11.0	135	319	7.7	1.6	183
3	42879	6.8	480	1244	3.5	7.0	6558	1723	0.0	25.2	6.3	65.1	28.5	0.0	51	19.2	174	360	8.6	2.1	211
4	42880	6.9	187	500	3.5	7.0	4213	1241	0.0	16.3	3.9	64.4	31.6	0.0	41	11.7	230	253	6.4	1.5	177
5	42881	6.7	276	808	3.5	7.0	4010	1217	0.0	16.1	6.4	62.1	31.4	0.0	38	13.2	185	313	8.6	1.7	190
6	42882	7.2	465	1121	4.5	7.0	4550	1186	0.0	17.8	8.1	64.1	27.8	0.0	38	20.4	197	424	6.0	2.3	183
7	42883	7.0	492	1283	4.5	7.0	6007	1441	0.0	22.7	7.3	66.3	26.5	0.0	53	24.2	224	312	7.5	2.8	178
8	42884	6.7	259	559	2.5	7.0	3862	1220	0.0	15.5	4.6	62.5	32.9	0.0	38	11.9	204	313	9.2	1.6	191
9	42885	6.8	192	459	2.5	7.0	4574	1184	0.0	17.0	3.5	67.4	29.1	0.0	42	11.4	261	257	5.9	1.5	190
10	42886	6.6	226	655	2.0	7.0	4240	1304	0.0	16.9	5.0	62.8	32.2	0.0	37	8.5	185	308	6.4	1.4	182
11	42887	6.4	228	510	2.0	7.0	4322	1417	0.0	17.4	3.8	62.2	34.0	0.0	37	6.5	155	301	6.1	1.5	175
12	42888	6.8	118	441	2.5	7.0	3665	1052	0.0	14.1	4.0	64.9	31.1	0.0	36	8.4	319	295	5.7	1.5	184
13	42889	6.7	38	433	2.5	7.0	3955	1413	0.0	16.3	3.4	60.5	36.1	0.0	50	3.2	125	178	3.9	1.6	380
14	42890	7.0	121	476	3.5	7.0	4520	1285	0.0	17.3	3.5	65.5	31.0	0.0	40	6.8	311	307	7.2	1.9	151
15	42891	6.5	74	468	3.5	7.0	3644	1181	0.0	14.6	4.1	62.3	33.6	0.0	37	5.3	213	224	5.7	1.5	168
16	42892	6.6	58	406	2.5	7.0	4068	1313	0.0	16.2	3.2	62.9	33.9	0.0	37	4.7	185	214	4.5	1.4	177
Averages		6.8	239	712	3.2	7.0	4479	1306	0.0	17.6	5.0	63.7	31.2	0.0	41	11.1	209	296	6.7	1.7	193

\* OM reported using Color Card

(b) (6)

(b) (6)

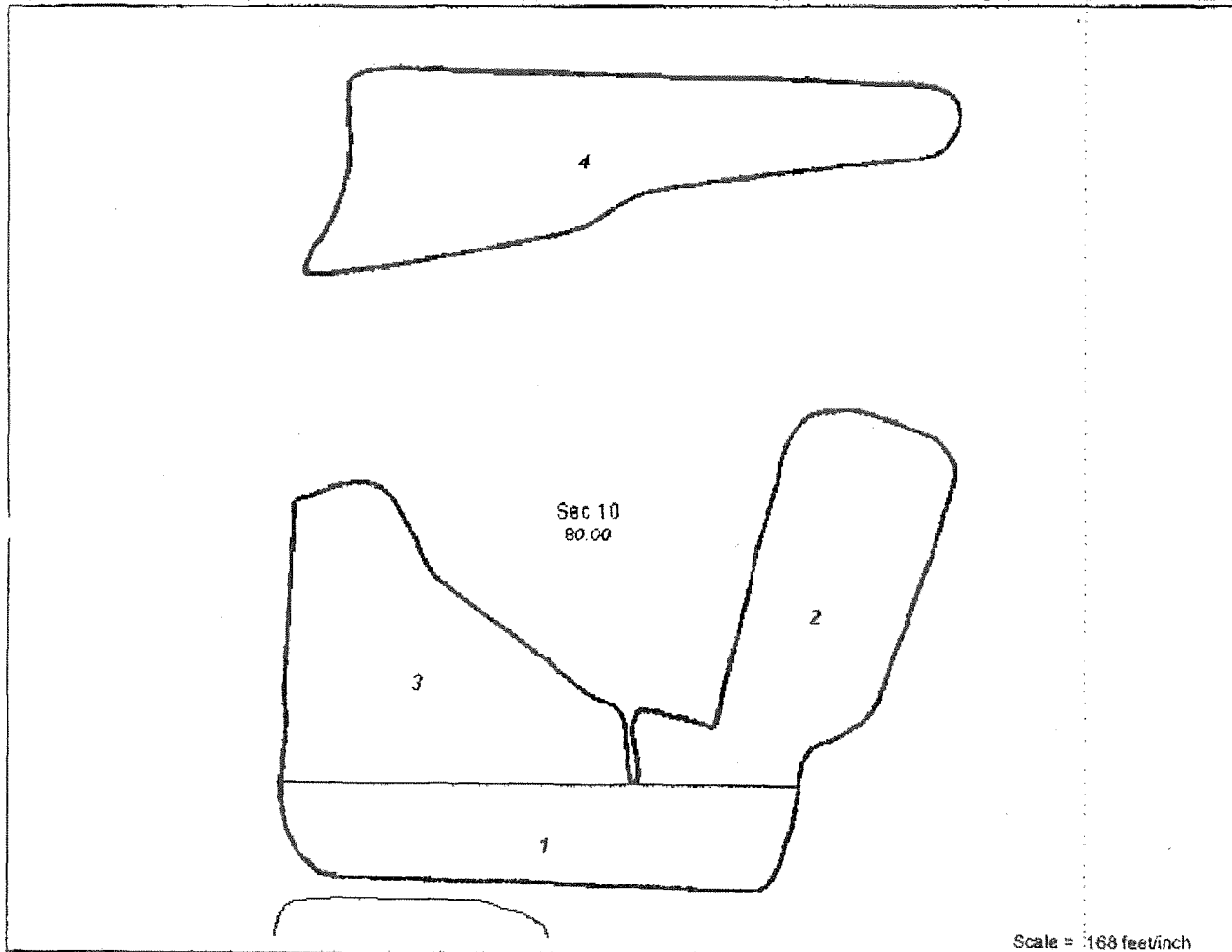
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## Rancho Cantera LLC

## SampleID

Prepared For: Rancho Cantera LLC	County: Stephenson, IL
Farm: Dairy Farm	Twp Rng Sec: Kent 10
Field: Sec 10	Directions: N Sunnyside Rd - W Klass Rd
Crop Zone:	Prepared By: GMS Laboratories
Crop Year:	Acres: 80.00



<b>Layer Summary</b> Layer: 2008 Soil Test Regions Attribute: SampleID Acres: 14.50 Average: Weighted Average: Minimum: Maximum:	<i>North of Dairy</i>
---	-----------------------

# Rancho Cantera LLC

## Soil Test Results

Prepared For: Rancho Cantera LLC	County: Stephenson, IL
Farm: Dairy Farm	Twp Rng Sec: Kent 10
Field: Sec 10	Directions: N Sunnyside Rd - W Klass Rd
Crop Zone:	Prepared By: GMS Laboratories
Crop Year:	Acres: 80.00

Layer Name: 2008 Soil Test Regions

Date Sampled: June 19, 2008

SampleID	LabID	pH	BpH	P1	K	OM	H	CEC	Ca	Mg	S	Zn	Cu
	none	none	none	LbsPerAcres	LbsPerAcres	%	mg/100g	mg/100g	LbsPerAcres	LbsPerAcres	ppm	ppm	ppm
1		7.0	7.0	92	355	4.5		18.8	4133	1439	33	8.2	3.8
2		6.9	7.0	84	373	4.5		14.3	3588	1178	34	5.8	2.9
3		6.8	7.0	96	314	4.5		15.3	3845	1279	33	7.4	3.7
4		6.7	7.0	590	1118	4.5		26.5	7119	1751	51	19.9	4.9
Average:		6.9	7.0	216	540	4.5		18.2	4666	1412	38	10.3	3.8

Field D P = 90.6 K = 347

 $P_2O_5 = 208.4$   $K_2O = 416.8$ 

Field E P = 590 K = 1118

 $P_2O_5 = 1357$   $K_2O = 1391.6$

(b) (6)

## GMS Labs Soil Testing Report

Dealer: Independent Grower (#900100)

Client: (b) (6)

Farm: Rancho Cantera LLC

Field: Dairy Farm Sec 10

June 18, 2008

Work order #1620

File #: 148.1

No of samples: 4



GMS Laboratories, Inc.

23877 E. North Rd. PO Box 61

Cropsey, IL 61731

Ph: (309) 377-2851 Fax: (309) 377-2017

Smp#	Lab#	pH	P #/a	K #/a	OM *	BpH	Ca #/a	Mg #/a	meq/100g		Base Saturation				S ppm	Zn ppm	Mn ppm	Fe ppm	Cu ppm	B ppm	Na
									H	CEC	%K	%Ca	%Mg	%H							
1	42836	7.0	92	355	4.5	7.0	4133	1439	0.0	16.8	2.7	61.6	35.7	0.0	33	8.2	205	202	3.8	1.2	173
2	42837	6.9	84	373	4.5	7.0	3568	1178	0.0	14.3	3.3	62.3	34.3	0.0	34	5.8	235	228	2.9	1.2	200
3	42838	6.8	96	314	4.5	7.0	3845	1279	0.0	15.3	2.6	62.6	34.7	0.0	33	7.4	214	217	3.7	1.1	195
4	42839	6.7	590	1118	4.5	7.0	7119	1751	0.0	26.5	5.4	67.1	27.5	0.0	51	19.9	110	355	4.9	1.8	191
Averages		6.8	216	540	4.5	7.0	4666	1412	0.0	18.2	3.5	63.4	33.0	0.0	38	10.3	191	251	3.8	1.3	190

\* OM reported using Color Card

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# Rancho Cantera LLC

## P1

Prepared For: Rancho Cantera LLC

Farm: Dairy Farm

Field: Sec 10

Crop Zone:

Crop Year:

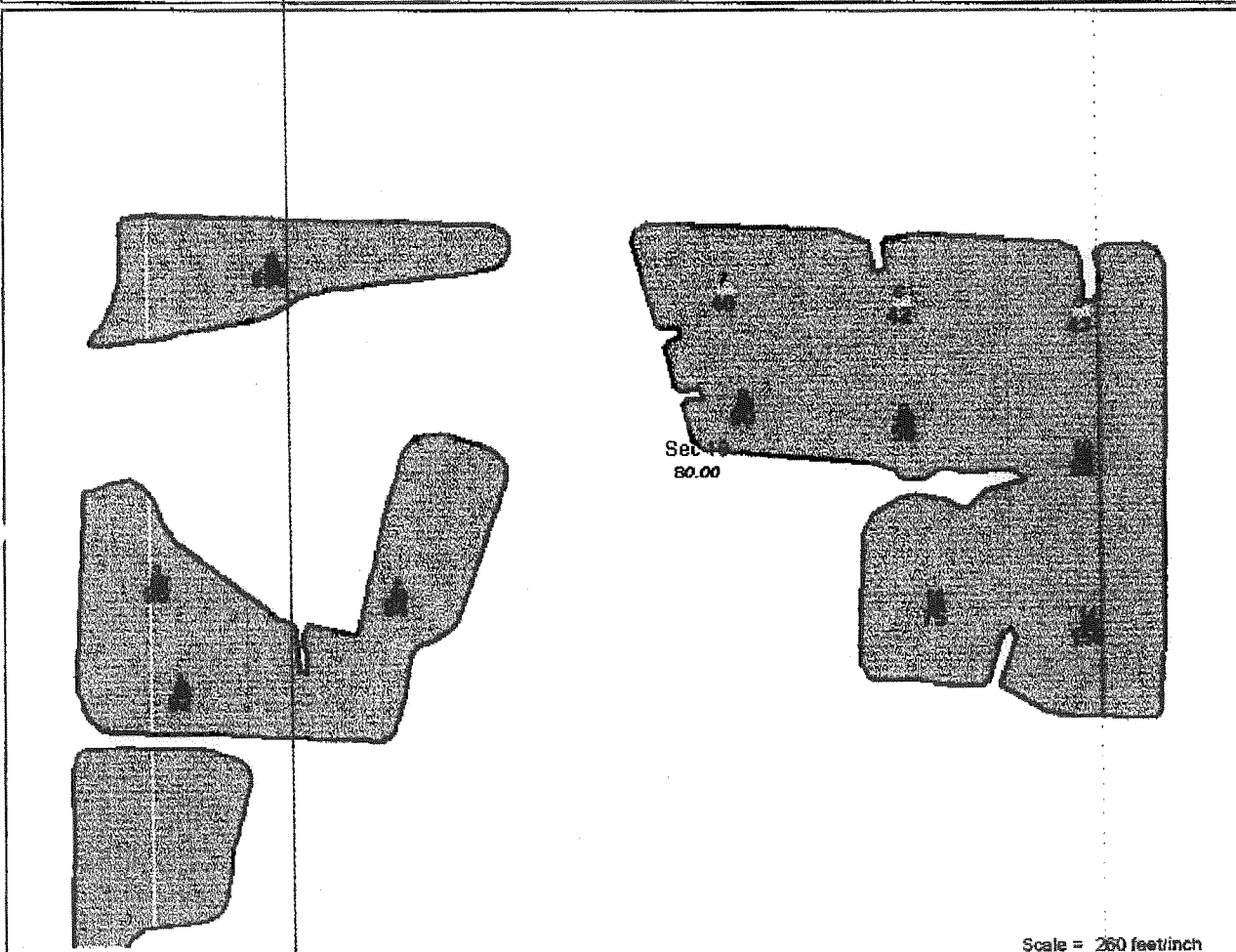
Acres: 80.00

County: Stephenson, IL

Twp Rng Sec: Kent 10

Directions: N Sunnyside Rd - W Klass Rd

Prepared By: GMS Laboratories



Layer Summary		P1 (LbsPerAcre (st))	Sites
Layer: 2008 Soil Test Sites			
Attribute: P1			
Records:	12		
Average:	119		
Weighted Average:			
Minimum:	40		
Maximum:	590		
		Below 40	
		40 to 45	3
		45 to 50	
		Above 50	9



# Rancho Cantera LLC

pH

Prepared For: Rancho Cantera LLC

Farm: Dairy Farm

Field: Sec 10

Crop Zone:

Crop Year:

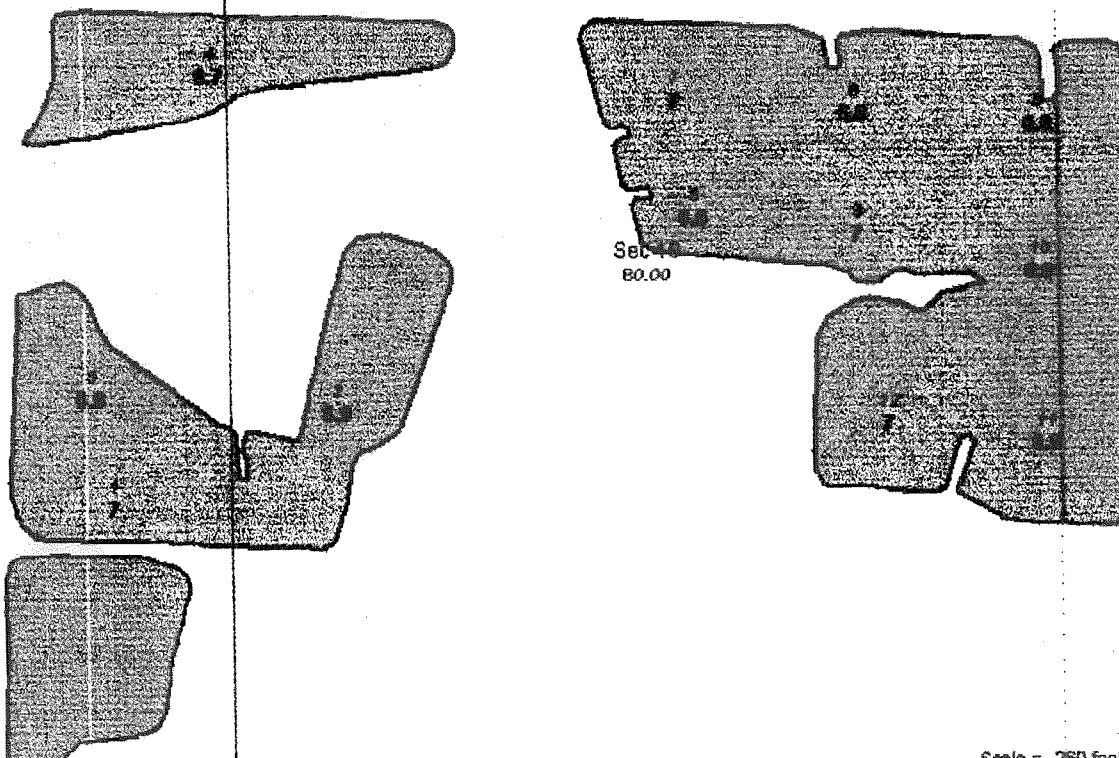
Acres: 80.00

County: Stephenson, IL

Twp Rng Sec: Kent 10

Directions: N Sunnyside Rd - W Klass Rd

Prepared By: GMS Laboratories



Scale = 260 feet/inch

## Layer Summary

Layer: 2008 Soil Test Sites

Attribute: pH

Records: 12

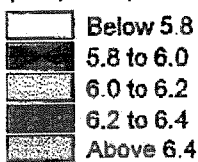
Average: 6.9

Weighted Average:

Minimum: 6.7

Maximum: 7.0

pH (none)



Sites

12



**Mowers Soil Testing Plus, Inc.**

Toulon, IL 61483-0540

(309)286-2761

Customer: (b) (6)

Field: (b) (6)

Acres: 67.3

# of Samples: 29

Phosphorus Results - Lbs/A

County: Jo Daviess

Township: Wards Grove

Range: 5E

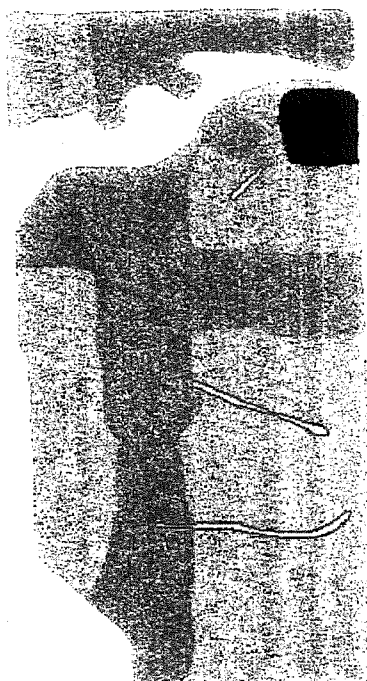
Section: 16

Date Tested: 05/19/2008

1 inch = 660 feet

Deficient  
Low  
Optimum  
High  
Excessive

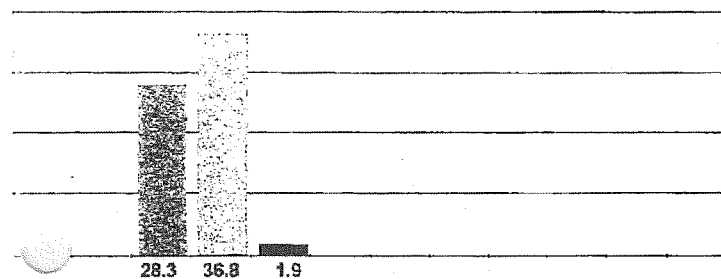
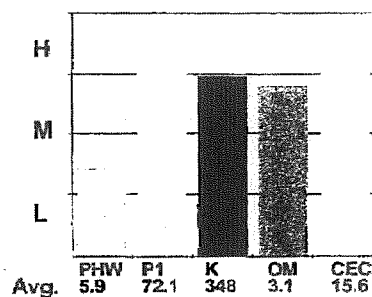
(b) (6)



Code: 42.3369

Code: 89.9327

Size: 330nsX330ew

**BREAKDOWN OF FIELD ACRES****FIELD NUTRIENT SUMMARY**

**Mowers Soil Testing Plus, Inc.**

Toulon, IL 61483-0540

(b) (6) 09)286-2761

County: Jo Daviess  
Township: Wards Grove

Range: 5E

Section: 16

Date Tested: 05/19/2008

1 inch = 660 feet

Acres: 67.3  
# of Samples: 29  
Water pH Results**Legend**

&lt; 5.8 Deficient

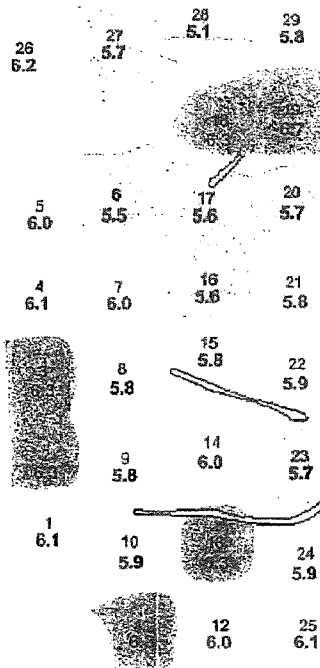
5.8 - 6.3 Low

6.3 - 6.8 Optimum

6.8 - 7.5 High

&gt; 7.5 Excessive

370m whole field

Latitude: 42.3369  
Longitude: 89.9327  
Grid Size: 330nsX330ew**BREAKDOWN OF FIELD ACRES**

H

L

Acres 14.8 41.8 10.4

**FIELD NUTRIENT SUMMARY**

H

M

L

Avg. PHN 5.8 P 72 K 348 OM 2.1 CEC 15.5

**Mowers Soil Testing Plus, Inc.**

Toulon, IL 61483-0540

(309)286-2761

(b) (6)

County: Jo Daviess  
Township: Wards Grove

Range: 5E

Section: 16

Date Tested: 05/19/2008

1 inch = 660 feet

Acres: 67.3

# of Samples: 29

Potassium Results - Lbs/A

**Legend**

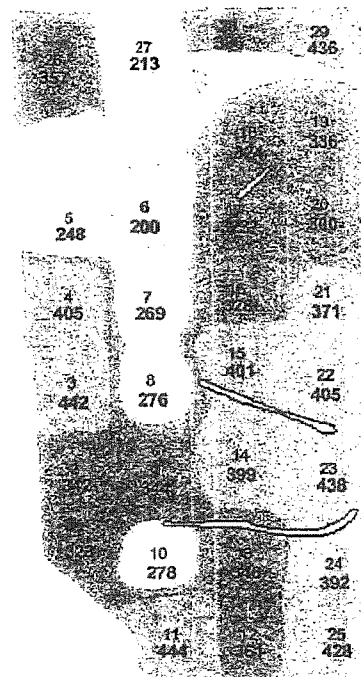
&lt; 210 Deficient

210 - 290 Low

290 - 370 Optimum

370 - 450 High

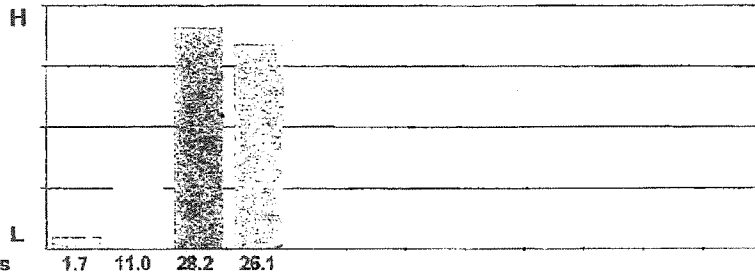
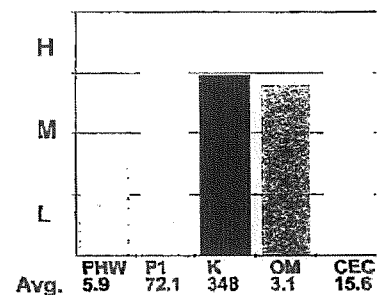
&gt; 450 Excessive



Latitude: 42.3369

Longitude: 89.9327

Grid Size: 330nsX330ew

**BREAKDOWN OF FIELD ACRES****FIELD NUTRIENT SUMMARY**



(b) (6)

# Soil Sample Grid



(b) (6)

Area: 132.27 ac

One in = 640 feet  
0 422 844 1266 1688 2110

— Field Boundary



## Soil Test Results

(b) (6)

Area: 132.27 ac

Min:	26	118	6.1	2.2	7	6.8
Max:	102	372	6.8	2.7	10	7.1
Avg:	42	184	6.4	2.4	8	5.3
Sample ID	P Bray 1	K	pH	OM	CEC	BpH
1	62	156	6.5	2.6	8	7.0
2	50	128	6.4	2.4	7	7.0
3	36	118	6.5	2.3	8	7.0
4	32	162	6.1	2.4	8	6.9
5	40	198	6.1	2.5	8	6.9
6	52	176	6.3	2.5	9	6.9
7	40	166	6.2	2.2	10	6.8
8	42	242	6.5	2.4	9	7.1
9	34	190	6.5	2.6	8	7.1
10	32	212	6.4	2.4	8	7.0
11	28	194	6.5	2.4	8	7.1
12	32	182	6.6	2.5	9	
13	26	178	6.4	2.4	8	7.1
14	28	176	6.6	2.4	9	
15	28	150	6.4	2.4	10	7.0
16	42	256	6.8	2.4	9	
17	46	208	6.5	2.4	8	7.0
18	44	168	6.6	2.4	8	
19	44	212	6.2	2.4	8	7.0
20	60	202	6.4	2.4	8	7.1
21	46	148	6.7	2.3	9	
22	74	148	6.6	2.4	8	
23	102	372	6.1	2.7	8	7.0
24	58	192	6.3	2.5	8	7.0
25	28	126	6.2	2.4	8	7.1
26	28	164	6.1	2.4	8	7.0
27	28	190	6.4	2.5	9	7.0
28	28	146	6.6	2.6	9	

**Soil Test Results**

(b) (6)

Area: 132.27 ac

Min:	34	100	5.9	2.2	8	6.9
Max:	246	462	7.3	2.7	10	7.1
Avg:	63	209	6.6	2.4	9	3.0
Sample ID	P Bray 1	K	pH	OM	CEC	BpH
29	46	166	5.9	2.2	8	7.0
30	50	170	6.0	2.4	9	6.9
31	68	228	6.3	2.3	8	7.1
32	62	226	6.4	2.4	8	7.0
33	60	200	6.6	2.5	9	
34	60	218	6.8	2.7	10	
35	66	222	6.0	2.6	9	6.9
36	36	100	6.9	2.4	10	
37	94	242	6.7	2.6	10	
38	76	244	7.0	2.4	10	
39	64	216	6.9	2.5	9	
40	42	208	6.8	2.4	9	
41	42	186	6.3	2.2	9	6.9
42	48	188	6.7	2.3	8	
43	40	204	6.6	2.5	8	
44	38	204	6.3	2.3	9	7.0
45	34	116	6.1	2.2	10	7.0
46	36	152	6.7	2.6	10	
47	48	202	6.5	2.6	10	6.9
48	54	154	6.4	2.2	9	6.9
49	60	230	6.8	2.5	9	
50	84	266	6.7	2.7	9	
51	246	462	7.3	2.2	10	

# Soil Sample Grid



(b) (6)

Area: 29.94 ac

One in = 363 feet  
0 132 264 396 528 660

Field Boundary





(b) (6)

Area: 29.94 ac

Min:	48	178	5.4	2.1	10	6.7
Max:	402	642	6.9	5.5	14	7.0
Avg:	90	256	6.1	3.0	11	5.1
Sample ID	P Bray 1	K	pH	OM	CEC	BpH
42	64	282	6.6	3.0	13	
43	50	220	5.7	2.9	10	6.8
44	50	220	5.4	2.6	10	6.7
45	52	246	5.8	2.8	13	6.7
46	62	250	5.7	2.5	12	6.7
47	48	182	5.8	2.3	10	6.8
48	64	206	6.3	2.1	11	6.9
49	72	198	6.5	3.2	11	7.0
50	56	178	5.9	3.0	10	6.8
51	60	210	6.4	2.9	11	6.9
52	106	240	6.9	3.5	12	
53	402	642	6.8	5.5	14	



West

### Soil Sample Grid



(b) (6)

Area: 64.31 ac

One in = 452 feet  
0 225 450 675 900 1125

— Field Boundary



GREEN PLAN  
SOLUTIONS

**Soil Test Results**

(b) (6)

Area: 64.31 ac

Min:	32	182	5.6	2.9	11	6.5
Max:	310	738	7.4	5.5	23	6.9
Avg:	151	366	6.9	4.1	19	1.4
Sample ID	P Bray 1	K	pH	OM	CEC	BpH
18	266	600	7.3	4.4	20	
19	140	288	6.6	4.6	19	
20	226	540	7.0	5.0	20	
21	310	738	7.3	4.6	22	
22	178	380	7.4	4.0	19	
23	200	562	7.4	4.5	23	
24	170	462	7.2	4.3	21	
25	144	320	7.4	4.0	21	
26	142	314	7.0	3.9	20	
27	146	262	7.3	4.2	20	
28	236	580	7.0	4.5	22	
29	222	614	6.9	5.5	22	
30	156	284	6.8	4.8	22	
31	78	226	6.5	3.6	18	6.9
32	148	312	6.7	4.2	21	
33	140	280	6.4	4.0	17	6.8
34	140	194	6.0	4.0	15	6.5
35	118	318	6.6	4.0	19	
36	140	298	6.5	4.2	20	6.8
37	68	228	7.0	3.1	17	
38	110	288	6.9	3.5	13	
39	72	320	6.8	3.6	15	
40	32	182	5.6	2.9	11	6.7
41	40	190	6.8	3.4	14	

Sent By: (b) (6)

(b) (6)

Dec-1-10 8:57AM;

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# Mowers Soil Testing Plus, Inc

Toulon, IL 61483-0540

1-309-286-2761

(b) (6)

County: Stephenson  
Township: Kent  
Range: 5-6E  
Section: 13

Date Tested: 11/04/2005

Acres: 135.3  
# of Samples: 58  
Water pH Results

1 inch = 660 feet

## Legend

< 5.8 Deficient

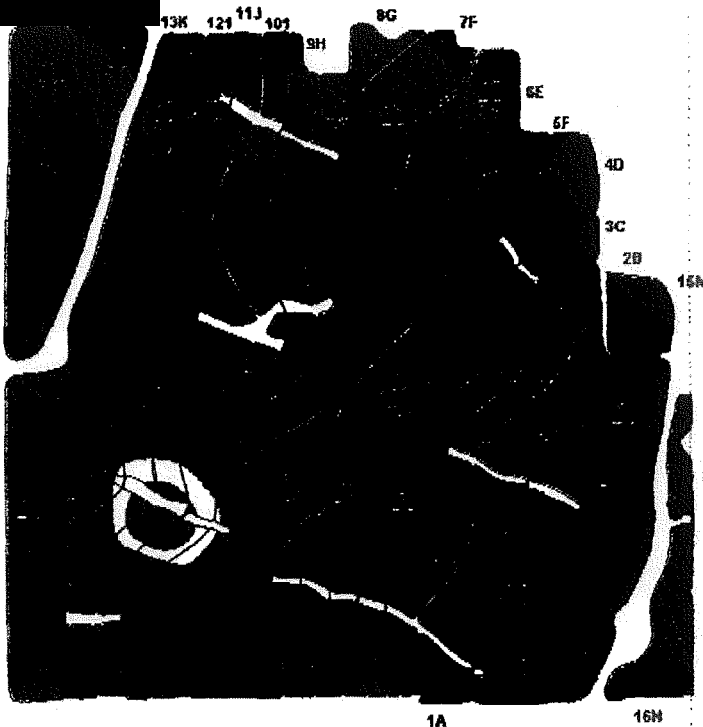
5.8 - 6.3 Low

6.3 - 6.8 Optimum

6.8 - 7.5 High

> 7.5 Excessive

(b) (6)



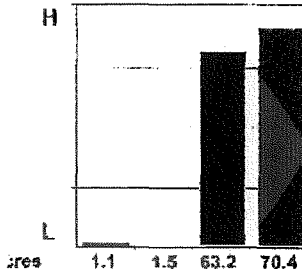
Total Map Acres: 136.2

Latitude: 42.3435

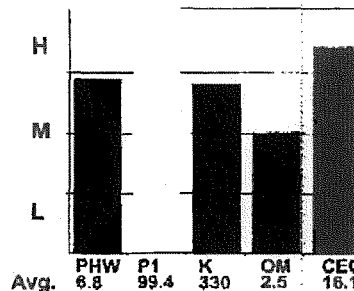
Longitude: 89.8856

Grid Size: 330nsX330ew

## BREAKDOWN OF FIELD ACRES



## FIELD NUTRIENT SUMMARY



Sent By (b) (6)

Dec-1-10 8:58AM;

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# Mowers Soil Testing Plus, Inc

Toulon, IL 61483-0540

1-309-286-2761

(b) (6)

County: Stephenson

Township: Kent

Range: 5-6E

Section: 13

Date Tested: 11/04/2005

1 inch = 660 feet

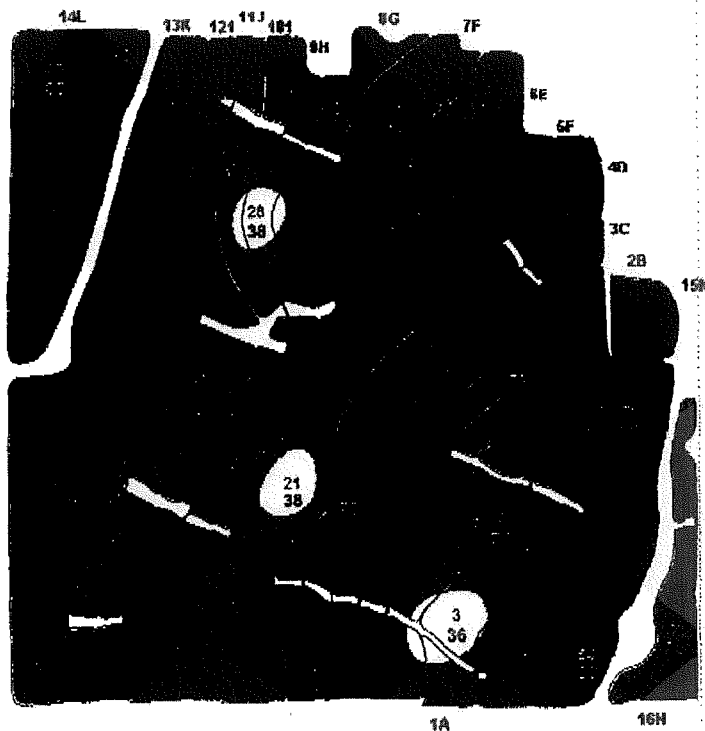
Acres: 135.3

# of Samples: 58

Phosphorus Results - Lbs/A

## Legend

- < 20 Deficient
- 20 - 40 Low
- 40 - 70 Optimum
- 70 - 100 High
- > 100 Excessive



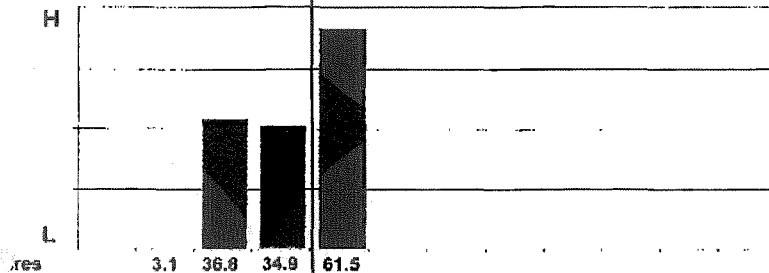
Total Map Acres: 136.3

Latitude: 42.3435

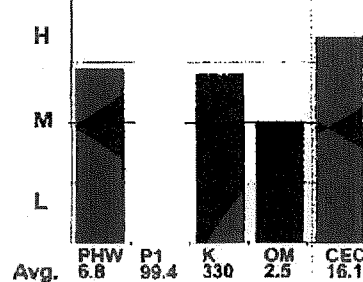
Longitude: 89.8856

Grid Size: 330nsX330ew

## BREAKDOWN OF FIELD ACRES



## FIELD NUTRIENT SUMMARY





(b) (6)

Sent By: (b) (6)

Dec-1-10 8:58AM;

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**Mowers Soil Testing Plus, Inc**  
Toulon, IL 61483-0540  
1-309-286-2781

(b) (6)

County: Stephenson  
Township: Kent  
Range: 5-8E  
Section: 13

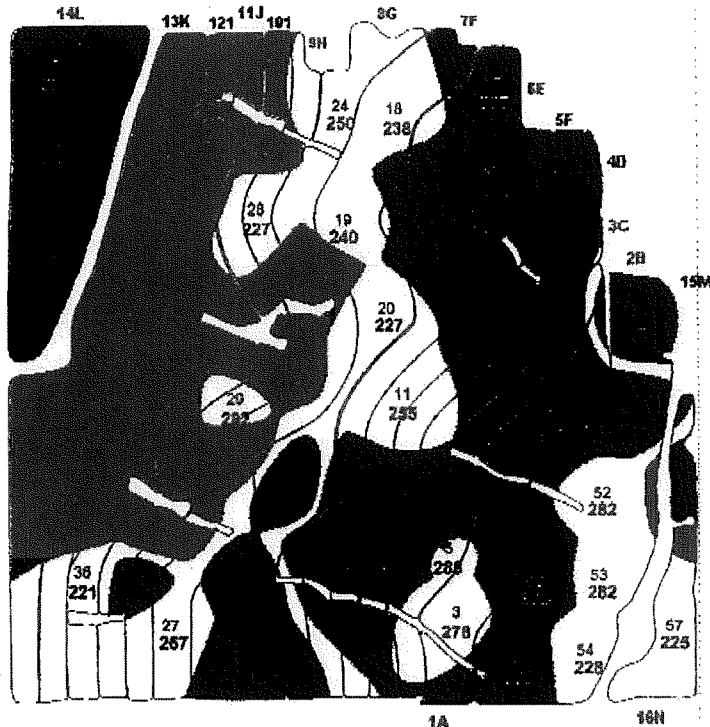
Date Tested: 11/04/2005

1 inch = 660 feet

# of Samples: 58  
Potassium Results - Lbs/A

**Legend**

< 210 Deficient  
210 - 290 Low  
290 - 370 Optimum  
370 - 450 High  
> 450 Excessive



## References

### Rancho Cantera LLC

<u>Manure Sample Analysis</u>	<u>(#/1000 gal or #/ton basis)</u>					
	N	NH <sub>4</sub>	OrgN	1st Year AvN	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Holding Pond	18.4	3.7	14.6	7.4	8.9	13.1

<u>Application Method</u>	<u>N retention</u>	<u>% N retention, from MWPS</u>
SURFACE, SOLID		0.75
SURFACE, LIQUID		0.8
AERWAY		0.9
SURFACE, INCORP		0.95
INJECT		0.98
IRRIGATE		0.7
NONE		0

<u>Organic N Mineralization</u>	<u>% of OrgN</u>
Year of Application	30.0%
1 Year after Application	15.0%
2 Years after Application	7.5%
3 Years after Application	3.8%
4 Years after Application	1.9%

<u>N, P, &amp; K Requirements</u>	<u>lbs/bu or t, from IL Agronomy Handbook</u>		
<u>Crop</u>	<u>N</u>	<u>P</u>	<u>K</u>
Corn	MRTN rate*	0.43	0.28
Soybeans	0	0.85	1.3
Corn Silage	1.2	2.6	7
Wheat	1	0.9	0.3
Grass Hay	150	12	50
Alfalfa Hay	0	12	50

\* Corn Nitrogen Rate Based on Maximum Return to Nitrogen Rate. Guidance concerning this rate can be found in section 16 of this CNMP and in Section 9 of the Illinois Agronomy Handbook.




# Estimated Manure Analysis

	N	NH4	OrgN	1st Year AvN lbs/1000 Gal	P2O5	K2O
Concrete Pad Runoff	0.0	0.0	0.0	0.0	0.0	0.0
Manure	31.0	6.0	25.0	14.6	15.0	22.0
Bedding	0.0	0.0	0.0	0.0	0.0	0.0
Parlor Water	4.0	3.0	1.0	2.5	2.0	3.0

Annual Production		
Source	Ft^3	Gallons
Concrete Pad Runoff	380,816	2,848,702
Manure	1,277,500	9,556,364
Bedding	357,700	2,675,782
Parlor Water	178,850	1,337,891
<b>Total</b>	<b>2,194,866</b>	<b>16,418,739</b>

Annual Nutrient Production						
	N	NH4	OrgN	1st Year AvN	P2O5	K2O
Concrete Pad Runoff	-	-	-	-	-	-
Manure	296,247.3	57,338.2	238,909.1	139,809.6	143,345.5	210,240.0
Bedding	-	-	-	-	-	-
Parlor Water	5,351.6	4,013.7	1,337.9	3,277.8	2,675.8	4,013.7
<b>Total</b>	<b>301,598.9</b>	<b>61,351.9</b>	<b>240,247.0</b>	<b>143,087.4</b>	<b>146,021.2</b>	<b>214,253.7</b>
<b>Average per 1000 gal</b>	<b>18.37</b>	<b>3.74</b>	<b>14.63</b>	<b>8.71</b>	<b>8.89</b>	<b>13.05</b>

R/c 19.1 (32) Rate  
 R/c 2.5 (52) 300  
 Rate



100



3.400

Feet



Environmental Engineers, Inc.

Phone: 217/487-7686  
Fax: 217/487-7687





- 4,250  
Feet



**Frank & West**  
Environmental Engineers, Inc.

7226 N. State Route 29 Phone: 217/487-7686  
Springfield, IL 62707 Fax: 217/487-7687

**Individual Field Information****Rancho Cantera LLC**

<b>Field Name:</b>	<u>R/C 116</u>	<b>Total Acres</b>	117.6
		<b>Non-Spreadable Acres</b>	5.3
<b>Township</b>	Kent	<b>Total Spreadable Acres</b>	112.3
<b>Section</b>	15		
<b>FSA Farm #</b>	562	<b>Predominant Soil Type:</b>	675B Greenbush silt loam
<b>FSA Tract #</b>	1970	<b>P test</b>	257
<b>FSA Field #'s</b>	14	<b>K test</b>	787

**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	0.0	20.7	31.0	36.2
Total N Credits	(lb/acre)		0.0	0.0	20.7	31.0	36.2
Crop N Need Minus Credits	(lb/acre)		197.0	197.0	176.3	166.0	160.8
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P & K needed are listed for calculation & uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>R/C 116</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + (OrgN * .35)	(Lbs/1000 Gal)			7.38	7.38	7.38	7.38
N App Rate (Crop N Need / 1st Yr Av N)	(1000 Gal/Acre)			26.7	23.9	22.5	21.8
P App Rate (Maintenance P / P in analysis)	(1000 Gal/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Prate	Prate	Prate	Prate
<b>Application Rate to Use</b>	<b>(1000 Gal)</b>		<b>0.0</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>
Total application (App Rate * Spreadable Acres)	(Gallons)			1,059,490	1,059,490	1,059,490	1,059,490
N applied (1st Year AvN * App rate)	(Lbs/Acre)			70	70	70	70
P applied (P in manure * App rate)	(Lbs/Acre)			84	84	84	84
K applied (K in manure * App rate)	(Lbs/Acre)			123	123	123	123
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>197</b>	<b>127</b>	<b>107</b>	<b>96</b>	<b>91</b>
Acres Covered	(Acres)		0.0	0.0	112.3	112.3	112.3

**Individual Field Information****Rancho Cantera LLC****Field Name:**R/C 19.1**Total Acres**

22.9

**Non-Spreadable Acres**

3.8

**Total Spreadable Acres**

19.1

**Township**

Kent

**Section**

15

**FSA Farm #**

562

**Predominant Soil Type:**

280C2 Fayette silt loam

**FSA Tract #**

1970

**P test**

321.5

**FSA Field #'s**

5

**K test**

964.5

**Individual Field Application & Nutrients**

<b>Crop needs</b>	<b>Year</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	17.2	8.6	14.7	17.7
Total N Credits	(lb/acre)		0.0	17.2	8.6	14.7	17.7
Crop N Need Minus Credits	(lb/acre)		197.0	179.8	188.4	182.3	179.3
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>R/C 19.1</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method					LINE1	LINE1	LINE1
1st Year Available N ( <i>Am-N * N retention due to app method</i> ) + ( <i>OrgN * .35</i> )	(Lbs/1000 Gal or Lbs/Ton)				7.38	7.38	7.38
N App Rate ( <i>Crop N Need / 1st Yr Av N</i> )	(1000 Gal/Acre or Ton/Acre)				25.5	24.7	24.3
P App Rate ( <i>Maintenance P / P in analysis</i> )	(1000 Gal/Acre or Ton/Acre)				9.43	9.43	9.43
Apply at Prate or Nrate?					Prate	Prate	Prate
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>15.7</b>	<b>0.0</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>
Total application ( <i>App Rate * Spreadable Acres</i> )	(Gallons or Tons)				179,773	179,773	179,773
N applied ( <i>1st Year AvN * App rate</i> )	(Lbs/Acre)				70	70	70
P applied ( <i>P in manure * App rate</i> )	(Lbs/Acre)				84	84	84
K applied ( <i>K in manure * App rate</i> )	(Lbs/Acre)				123	123	123
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>81</b>	<b>180</b>	<b>119</b>	<b>113</b>	<b>110</b>
Acres Covered	(Acres)		19.1	0.0	19.1	19.1	19.1



**Individual Field Information****Rancho Cantera LLC****Field Name:**R/C 40**Total Acres**

44.4

**Non-Spreadable Acres**

2.6

**Total Spreadable Acres**

41.8

**Township**

Kent

**Section**

14

**FSA Farm #**

562

**Predominant Soil Type:**735D2 Casco Rodman  
Fox Complex**FSA Tract #**

1970

**P test**

119.5

**FSA Field #'s**

7

**K test**

463.5

**Individual Field Application & Nutrients**

<b>Crop needs</b>	<b>Year</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	17.2	25.1	38.1	42.7
Total N Credits	(lb/acre)		0.0	17.2	25.1	38.1	42.7
Crop N Need Minus Credits	(lb/acre)		197.0	179.8	171.9	158.9	154.3
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>R/C 40</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	
1st Year Available N ( <i>Am-N * N retention due to app method</i> ) + ( <i>OrgN * .35</i> )	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	
N App Rate ( <i>Crop N Need / 1st Yr Av N</i> )	(1000 Gal/Acre or Ton/Acre)			24.4	23.3	21.5	
P App Rate ( <i>Maintenance P / P in analysis</i> )	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	
Apply at Prate or Nrate?				Nrate	Nrate	Nrate	
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>15.7</b>	<b>15.0</b>	<b>23.3</b>	<b>21.5</b>	<b>0.0</b>
Total application ( <i>App Rate * Spreadable Acres</i> )	(Gallons or Tons)			626,400	972,728	899,050	
N applied ( <i>1st Year AvN * App rate</i> )	(Lbs/Acre)			111	172	159	
P applied ( <i>P in manure * App rate</i> )	(Lbs/Acre)			133	207	191	
K applied ( <i>K in manure * App rate</i> )	(Lbs/Acre)			196	304	281	
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>81</b>	<b>69</b>	<b>0</b>	<b>0</b>	<b>154</b>
Acres Covered	(Acres)		41.8	41.8	41.8	41.8	0.0

**Individual Field Information****Rancho Cantera LLC****Field Name:**R/C 8.1**Total Acres**

10.3

**Non-Spreadable Acres**

2.2

**Total Spreadable Acres**

8.1

**Township**

Kent

**Section**

10

**FSA Farm #**

562

**Predominant Soil Type:**

280C2 Fayette silt loam

**FSA Tract #**

1970

**P test**

92

**FSA Field #'s**

3

**K test**

355

**Individual Field Application & Nutrients**

<b>Crop needs</b>	<b>Year</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	0.0	16.5	8.2	32.2
Total N Credits	(lb/acre)		0.0	0.0	16.5	8.2	32.2
Crop N Need Minus Credits	(lb/acre)		197.0	197.0	180.5	188.8	164.8
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>R/C 8.1</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1		LINE1	LINE1
1st Year Available N ( <i>Am-N * N retention due to app method</i> ) + ( <i>OrgN * .35</i> )	(Lbs/1000 Gal or Lbs/Ton)			7.38		7.38	7.38
N App Rate ( <i>Crop N Need / 1st Yr Av N</i> )	(1000 Gal/Acre or Ton/Acre)			26.7		25.6	22.3
P App Rate ( <i>Maintenance P / P in analysis</i> )	(1000 Gal/Acre or Ton/Acre)			9.43		9.43	9.43
Apply at Prate or Nrate?				Nrate		Nrate	Nrate
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>0.0</b>	<b>15.0</b>	<b>0.0</b>	<b>25.6</b>	<b>22.3</b>
Total application ( <i>App Rate * Spreadable Acres</i> )	(Gallons or Tons)			121,500		207,159	180,879
N applied ( <i>1st Year AvN * App rate</i> )	(Lbs/Acre)			111		189	165
P applied ( <i>P in manure * App rate</i> )	(Lbs/Acre)			133		227	199
K applied ( <i>K in manure * App rate</i> )	(Lbs/Acre)			196		334	291
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>197</b>	<b>86</b>	<b>181</b>	<b>0</b>	<b>0</b>
Acres Covered	(Acres)		0.0	8.1	0.0	8.1	8.1

**Individual Field Information****Rancho Cantera LLC**

Field Name:

R/C 2.5

Total Acres

5.1

Non-Spreadable Acres

2.6

Total Spreadable Acres

2.5

Township

Kent

Section

10

FSA Farm #

562

Predominant Soil Type:

8451A Lawosn silt loam

FSA Tract #

1970

P test

590

FSA Field #'s

1

K test

1357

**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	0.0	0.0	0.0	10.3
Total N Credits	(lb/acre)		0.0	0.0	0.0	0.0	10.3
Crop N Need Minus Credits	(lb/acre)		197.0	197.0	197.0	197.0	186.7
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>R/C 2.5</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method						LINE1	LINE1
1st Year Available N ( <i>Am-N * N retention due to app method</i> ) + ( <i>OrgN * .35</i> )	(Lbs/1000 Gal or Lbs/Ton)					7.38	7.38
N App Rate ( <i>Crop N Need / 1st Yr Av N</i> )	(1000 Gal/Acre or Ton/Acre)					26.7	25.3
P App Rate ( <i>Maintenance P / P in analysis</i> )	(1000 Gal/Acre or Ton/Acre)					9.43	9.43
Apply at Prate or Nrate?						Prate	Prate
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>9.4</b>	<b>9.4</b>
Total application ( <i>App Rate * Spreadable Acres</i> )	(Gallons or Tons)					23,580	23,580
N applied ( <i>1st Year AvN * App rate</i> )	(Lbs/Acre)					70	70
P applied ( <i>P in manure * App rate</i> )	(Lbs/Acre)					84	84
K applied ( <i>K in manure * App rate</i> )	(Lbs/Acre)					123	123
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>197</b>	<b>197</b>	<b>197</b>	<b>127</b>	<b>117</b>
Acres Covered	(Acres)		0.0	0.0	0.0	2.5	2.5

**Individual Field Information****Rancho Cantera LLC**

<b>Field Name:</b>	<u>R/C 24.2</u>	<b>Total Acres</b>	24.9
		<b>Non-Spreadable Acres</b>	0.7
<b>Township</b>	Kent	<b>Total Spreadable Acres</b>	24.2
<b>Section</b>	10		
<b>FSA Farm #</b>	562	<b>Predominant Soil Type:</b>	280C2 Fayette silt loam
<b>FSA Tract #</b>	1970	<b>P test</b>	50
<b>FSA Field #'s</b>	2	<b>K test</b>	234

**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	17.2	19.0	19.8	9.9
Total N Credits	(lb/acre)		0.0	17.2	19.0	19.8	9.9
Crop N Need Minus Credits	(lb/acre)		197.0	179.8	178.0	177.2	187.1
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P & K needed are listed for calculation & uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor



<b>Rancho Cantera LLC</b>							
<b>R/C 24.2</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1		LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + (OrgN * .35)	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38		7.38
N App Rate (Crop N Need / 1st Yr Av N)	(1000 Gal/Acre or Ton/Acre)			24.4	24.1		25.3
P App Rate (Maintenance P / P in analysis)	(1000 Gal/Acre or Ton/Acre)			9.43	9.43		9.43
Apply at Prate or Nrate?				Prate	Prate		Prate
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>15.7</b>	<b>9.4</b>	<b>9.4</b>	<b>0.0</b>	<b>9.4</b>
Total application (App Rate * Spreadable Acres)	(Gallons or Tons)			228,253	228,253		228,253
N applied (1st Year AvN * App rate)	(Lbs/Acre)			70	70		70
P applied (P in manure * App rate)	(Lbs/Acre)			84	84		84
K applied (K in manure * App rate)	(Lbs/Acre)			123	123		123
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>81</b>	<b>110</b>	<b>108</b>	<b>177</b>	<b>117</b>
Acres Covered	(Acres)		24.2	24.2	24.2	0.0	24.2

**Individual Field Information****Rancho Cantera LLC**

Field Name:

R/C 4.9

Total Acres

5.6

Non-Spreadable Acres

0.7

Total Spreadable Acres

4.9

Township

Kent

Section

15

FSA Farm #

562

Predominant Soil Type:

429C2 Palsgrove silt  
loam

FSA Tract #

1970

P test

--

FSA Field #'s

15

K test

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**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	0.0	0.0	10.3	5.2
Total N Credits	(lb/acre)		0.0	0.0	0.0	10.3	5.2
Crop N Need Minus Credits	(lb/acre)		197.0	197.0	197.0	186.7	191.8
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>R/C 4.9</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method					LINE1		LINE1
1st Year Available N ( <i>Am-N * N retention due to app method</i> ) + ( <i>OrgN * .35</i> )	(Lbs/1000 Gal or Lbs/Ton)				7.38		7.38
N App Rate ( <i>Crop N Need / 1st Yr Av N</i> )	(1000 Gal/Acre or Ton/Acre)				26.7		26.0
P App Rate ( <i>Maintenance P / P in analysis</i> )	(1000 Gal/Acre or Ton/Acre)				9.43		9.43
Apply at Prate or Nrate?					Prate		Prate
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>0.0</b>	<b>0.0</b>	<b>9.4</b>	<b>0.0</b>	<b>9.4</b>
Total application ( <i>App Rate * Spreadable Acres</i> )	(Gallons or Tons)				46,217		46,060
N applied ( <i>1st Year AvN * App rate</i> )	(Lbs/Acre)				70		69
P applied ( <i>P in manure * App rate</i> )	(Lbs/Acre)				84		84
K applied ( <i>K in manure * App rate</i> )	(Lbs/Acre)				123		123
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>197</b>	<b>197</b>	<b>127</b>	<b>187</b>	<b>122</b>
Acres Covered	(Acres)		0.0	0.0	4.9	0.0	4.9

**Individual Field Information****Rancho Cantera LLC****Field Name:**

(b) (6)

**Total Acres**

68.4

**Non-Spreadable Acres**

7.0

**Total Spreadable Acres**

61.4

**Township**

Wards Grove

**Section**

16

**FSA Farm #**

0

**Predominant Soil Type:**675B Greenbush silt  
loam**FSA Tract #**

0

**P test**

72.1

**FSA Field #'s**

0

**K test**

348

**Individual Field Application & Nutrients**

<b>Crop needs</b>	<b>Year</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	39.9	59.9	64.8	66.0
Total N Credits	(lb/acre)		0.0	39.9	59.9	64.8	66.0
Crop N Need Minus Credits	(lb/acre)		197.0	157.1	137.1	132.2	131.0
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

Rancho Cantera LLC							
(b) (6)		2009	2010	2011	2012	2013	2014
Manure Application		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + (OrgN * .35)	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	7.38
N App Rate (Crop N Need / 1st Yr Av N)	(1000 Gal/Acre or Ton/Acre)			21.3	18.6	17.9	17.8
P App Rate (Maintenance P / P in analysis)	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Nrate	Nrate	Nrate	Nrate
Application Rate to Use	(1000 Gal or Ton)		21.3	21.3	18.6	17.9	17.8
Total application (App Rate * Spreadable Acres)	(Gallons or Tons)			1,306,549	1,140,759	1,099,979	1,089,949
N applied (1st Year AvN * App rate)	(Lbs/Acre)			157	137	132	131
P applied (P in manure * App rate)	(Lbs/Acre)			189	165	159	158
K applied (K in manure * App rate)	(Lbs/Acre)			278	242	234	232
Additional N Needed	(Lbs/Acre)		-88	0	0	0	0
Acres Covered	(Acres)		61.4	61.4	61.4	61.4	61.4

**Individual Field Information****Rancho Cantera LLC**

Field Name:

(b) (6)

Total Acres

76.1

Non-Spreadable Acres

0.0

Total Spreadable Acres

76.1

Township

Kent

Section

14

FSA Farm #

0

Predominant Soil Type:

280C2 Fayette silt loam

FSA Tract #

0

P test

40

FSA Field #'s

0

K test

177

**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	45.2	61.2	65.1	66.1
Total N Credits	(lb/acre)		0.0	45.2	61.2	65.1	66.1
Crop N Need Minus Credits	(lb/acre)		197.0	151.8	135.8	131.9	130.9
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>(b) (6) 76.1</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( <i>Am-N * N retention due to app method</i> ) + ( <i>OrgN * .35</i> )	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	7.38
N App Rate ( <i>Crop N Need / 1st Yr Av N</i> )	(1000 Gal/Acre or Ton/Acre)			20.6	18.4	17.9	17.7
P App Rate ( <i>Maintenance P / P in analysis</i> )	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Nrate	Nrate	Nrate	Nrate
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>24.1</b>	<b>20.6</b>	<b>18.4</b>	<b>17.9</b>	<b>13.1</b>
Total application ( <i>App Rate * Spreadable Acres</i> )	(Gallons or Tons)			1,565,226	1,400,558	1,360,055	1,000,000
N applied ( <i>1st Year AvN * App rate</i> )	(Lbs/Acre)			152	136	132	97
P applied ( <i>P in manure * App rate</i> )	(Lbs/Acre)			183	164	159	117
K applied ( <i>K in manure * App rate</i> )	(Lbs/Acre)			268	240	233	171
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>-125</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>34</b>
Acres Covered	(Acres)		76.1	76.1	76.1	76.1	76.1



**Individual Field Information****Rancho Cantera LLC**

Field Name:

(b) (6)

Total Acres

58.3

Non-Spreadable Acres

1.9

Total Spreadable Acres

56.4

Township

Kent

Section

14

FSA Farm #

0

Predominant Soil Type:

280C2 Fayette silt loam

FSA Tract #

0

P test

54

FSA Field #'s

0

K test

204

**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	40.9	60.1	64.8	66.0
Total N Credits	(lb/acre)		0.0	40.9	60.1	64.8	66.0
Crop N Need Minus Credits	(lb/acre)		197.0	156.1	136.9	132.2	131.0
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>(b) (6) 56.4</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + (OrgN * .35)	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	7.38
N App Rate (Crop N Need / 1st Yr Av N)	(1000 Gal/Acre or Ton/Acre)			21.2	18.5	17.9	17.7
P App Rate (Maintenance P / P in analysis)	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Nrate	Nrate	Nrate	Nrate
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>21.8</b>	<b>21.2</b>	<b>18.5</b>	<b>17.9</b>	<b>17.7</b>
Total application (App Rate * Spreadable Acres)	(Gallons or Tons)			1,192,989	1,000,000	1,009,971	1,001,084
N applied (1st Year AvN * App rate)	(Lbs/Acre)			156	137	132	131
P applied (P in manure * App rate)	(Lbs/Acre)			188	165	159	158
K applied (K in manure * App rate)	(Lbs/Acre)			276	242	234	232
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>36</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Acres Covered	(Acres)		56.4	56.4	53.9	56.4	56.4

**Individual Field Information****Rancho Cantera LLC**

Field Name:

(b) (6)

Total Acres

10.5

Non-Spreadable Acres

5.6

Total Spreadable Acres

4.9

Township

Kent

Section

14

FSA Farm #

0

Predominant Soil Type:

280C2 Fayette silt loam

FSA Tract #

0

P test

151

FSA Field #'s

0

K test

366

**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	37.5	59.3	64.6	65.9
Total N Credits	(lb/acre)		0.0	37.5	59.3	64.6	65.9
Crop N Need Minus Credits	(lb/acre)		197.0	159.5	137.7	132.4	131.1
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

Rancho Cantera LLC							
(b) (6)		2009	2010	2011	2012	2013	2014
Manure Application		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	
1st Year Available N ( $Am-N * N$ retention due to app method) + (OrgN * .35)	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	
N App Rate (Crop N Need / 1st Yr Av N)	(1000 Gal/Acre or Ton/Acre)			21.6	18.7	17.9	
P App Rate (Maintenance P / P in analysis)	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	
Apply at Prate or Nrate?				Nrate	Nrate	Nrate	
Application Rate to Use	(1000 Gal or Ton)		20.0	21.6	18.7	17.9	0.0
Total application (App Rate * Spreadable Acres)	(Gallons or Tons)			105,887	91,436	87,881	
N applied (1st Year AvN * App rate)	(Lbs/Acre)			160	138	132	
P applied (P in manure * App rate)	(Lbs/Acre)			192	166	159	
K applied (K in manure * App rate)	(Lbs/Acre)			282	244	234	
Additional N Needed	(Lbs/Acre)		-71	0	0	0	131
Acres Covered	(Acres)		4.9	4.9	4.9	4.9	0.0

**Individual Field Information****Rancho Cantera LLC**

Field Name:

(b) 2

Total Acres

31.5

Non-Spreadable Acres

7.0

Total Spreadable Acres

24.5

Township

Kent

Section

14

FSA Farm #

0

Predominant Soil Type:

280C2 Fayette silt loam

FSA Tract #

0

P test

61

FSA Field #'s

0

K test

220

**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	52.9	63.0	65.6	66.2
Total N Credits	(lb/acre)		0.0	52.9	63.0	65.6	66.2
Crop N Need Minus Credits	(lb/acre)		197.0	144.1	134.0	131.4	130.8
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

Rancho Cantera LLC							
(b) (6) 2		2009	2010	2011	2012	2013	2014
Manure Application		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + (OrgN * .35)	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	7.38
N App Rate (Crop N Need / 1st Yr Av N)	(1000 Gal/Acre or Ton/Acre)			19.5	18.1	17.8	17.7
P App Rate (Maintenance P / P in analysis)	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Nrate	Nrate	Nrate	Nrate
Application Rate to Use	(1000 Gal or Ton)		28.2	19.5	18.1	17.8	17.7
Total application (App Rate * Spreadable Acres)	(Gallons or Tons)			478,399	444,626	436,319	434,275
N applied (1st Year AvN * App rate)	(Lbs/Acre)			144	134	131	131
P applied (P in manure * App rate)	(Lbs/Acre)			174	161	158	158
K applied (K in manure * App rate)	(Lbs/Acre)			255	237	232	231
Additional N Needed	(Lbs/Acre)		-180	0	0	0	0
Acres Covered	(Acres)		24.5	24.5	24.5	24.5	24.5

**Individual Field Information****Rancho Cantera LLC**

Field Name:

(b) &amp; 24.5

Total Acres

81.3

Non-Spreadable Acres

21.1

Total Spreadable Acres

60.1

Township

Kent

Section

13

FSA Farm #

0

Predominant Soil Type:

8451A Lawosn silt loam

FSA Tract #

0

P test

151

FSA Field #'s

0

K test

366

**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	48.0	61.9	65.3	32.6
Total N Credits	(lb/acre)		0.0	48.0	61.9	65.3	32.6
Crop N Need Minus Credits	(lb/acre)		197.0	149.0	135.1	131.7	164.4
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor



<b>Rancho Cantera LLC</b>							
<b>(b) (6) 35.7 &amp; 24.5</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1		LINE1
1st Year Available N ( <i>Am-N * N retention due to app method</i> ) + ( <i>OrgN * .35</i> )	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38		7.38
N App Rate ( <i>Crop N Need / 1st Yr Av N</i> )	(1000 Gal/Acre or Ton/Acre)			20.2	18.3		22.3
P App Rate ( <i>Maintenance P / P in analysis</i> )	(1000 Gal/Acre or Ton/Acre)			9.43	9.43		9.43
Apply at Prate or Nrate?				Nrate	Nrate		Nrate
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>25.6</b>	<b>20.2</b>	<b>18.3</b>	<b>0.0</b>	<b>22.3</b>
Total application ( <i>App Rate * Spreadable Acres</i> )	(Gallons or Tons)			1,213,439	1,100,641		1,338,621
N applied ( <i>1st Year AvN * App rate</i> )	(Lbs/Acre)			149	135		164
P applied ( <i>P in manure * App rate</i> )	(Lbs/Acre)			179	163		198
K applied ( <i>K in manure * App rate</i> )	(Lbs/Acre)			263	239		291
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>-146</b>	<b>0</b>	<b>0</b>	<b>132</b>	<b>0</b>
Acres Covered	(Acres)		60.1	60.1	60.1	0.0	60.1

**Individual Field Information****Rancho Cantera LLC**

Field Name:	R/C 135.3	Total Acres	142.7
		Non-Spreadable Acres	0.0
Township	Kent	Total Spreadable Acres	142.7
Section	13		
FSA Farm #	0	Predominant Soil Type:	280C2 Fayette silt loam
FSA Tract #	0	P test	99.4
FSA Field #'s	0	K test	330

**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	48.4	61.9	65.3	66.1
Total N Credits	(lb/acre)		0.0	48.4	61.9	65.3	66.1
Crop N Need Minus Credits	(lb/acre)		197.0	148.6	135.1	131.7	130.9
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P & K needed are listed for calculation & uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>R/C 135.3</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( <i>Am-N * N retention due to app method</i> ) + ( <i>OrgN * .35</i> )	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	7.38
N App Rate ( <i>Crop N Need / 1st Yr Av N</i> )	(1000 Gal/Acre or Ton/Acre)			20.1	18.3	17.8	17.7
P App Rate ( <i>Maintenance P / P in analysis</i> )	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Nrate	Nrate	Nrate	Nrate
<b>Application Rate to Use</b>	(1000 Gal or Ton)		<b>25.8</b>	<b>20.1</b>	<b>18.3</b>	<b>17.8</b>	<b>17.7</b>
Total application ( <i>App Rate * Spreadable Acres</i> )	(Gallons or Tons)			1,500,000	1,500,000	2,547,634	2,526,498
N applied ( <i>1st Year AvN * App rate</i> )	(Lbs/Acre)			148	135	132	131
P applied ( <i>P in manure * App rate</i> )	(Lbs/Acre)			179	163	159	157
K applied ( <i>K in manure * App rate</i> )	(Lbs/Acre)			262	239	233	231
<b>Additional N Needed</b>	(Lbs/Acre)		<b>-148</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Acres Covered	(Acres)		142.7	74.6	81.9	142.7	142.7

**Individual Field Information****Rancho Cantera LLC**

Field Name:

(b) (6) 40

Total Acres

35.6

Non-Spreadable Acres

11.0

Total Spreadable Acres

24.6

Township

Wards Grove

Section

16

FSA Farm #

0

Predominant Soil Type:

279B Rozetta silt loam

FSA Tract #

0

P test

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FSA Field #'s

0

K test

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**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	0.0	10.3	15.5	18.1
Total N Credits	(lb/acre)		0.0	0.0	10.3	15.5	18.1
Crop N Need Minus Credits	(lb/acre)		197.0	197.0	186.7	181.5	178.9
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>(b) (6) 40</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + (OrgN * .35)	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	7.38
N App Rate (Crop N Need / 1st Yr Av N)	(1000 Gal/Acre or Ton/Acre)			26.7	25.3	24.6	24.2
P App Rate (Maintenance P / P in analysis)	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Prate	Prate	Prate	Prate
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>0.0</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>
Total application (App Rate * Spreadable Acres)	(Gallons or Tons)			232,403	232,403	232,403	232,403
N applied (1st Year AvN * App rate)	(Lbs/Acre)			70	70	70	70
P applied (P in manure * App rate)	(Lbs/Acre)			84	84	84	84
K applied (K in manure * App rate)	(Lbs/Acre)			123	123	123	123
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>197</b>	<b>127</b>	<b>117</b>	<b>112</b>	<b>109</b>
Acres Covered	(Acres)		0.0	24.6	24.6	24.6	24.6

**Individual Field Information****Rancho Cantera LLC**

Field Name:

(b) (6) 120

Total Acres

107.2

Non-Spreadable Acres

21.9

Total Spreadable Acres

85.3

Township

Kent

Section

15

FSA Farm #

0

Predominant Soil Type:

675C2 Greenbush silt  
loam

FSA Tract #

0

P test

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FSA Field #'s

0

K test

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**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	0.0	10.3	15.5	18.1
Total N Credits	(lb/acre)		0.0	0.0	10.3	15.5	18.1
Crop N Need Minus Credits	(lb/acre)		197.0	197.0	186.7	181.5	178.9
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

Rancho Cantera LLC							
(b) (6) 120		2009	2010	2011	2012	2013	2014
Manure Application		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + (OrgN * .35)	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	7.38
N App Rate (Crop N Need / 1st Yr Av N)	(1000 Gal/Acre or Ton/Acre)			26.7	25.3	24.6	24.2
P App Rate (Maintenance P / P in analysis)	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Prate	Prate	Prate	Prate
Application Rate to Use	(1000 Gal or Ton)		0.0	9.4	9.4	9.4	9.4
Total application (App Rate * Spreadable Acres)	(Gallons or Tons)			804,639	804,639	804,639	804,639
N applied (1st Year AvN * App rate)	(Lbs/Acre)			70	70	70	70
P applied (P in manure * App rate)	(Lbs/Acre)			84	84	84	84
K applied (K in manure * App rate)	(Lbs/Acre)			123	123	123	123
Additional N Needed	(Lbs/Acre)		197	127	117	112	109
Acres Covered	(Acres)		0.0	85.3	85.3	85.3	85.3



**Individual Field Information****Rancho Cantera LLC**

Field Name:

(b) (6) 80

Total Acres

62.3

Non-Spreadable Acres

15.0

Total Spreadable Acres

47.3

Township

Kent

Section

15

FSA Farm #

0

Predominant Soil Type:

675B Greenbush silt  
loam

FSA Tract #

0

P test

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FSA Field #'s

0

K test

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**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	0.0	10.3	15.5	18.1
Total N Credits	(lb/acre)		0.0	0.0	10.3	15.5	18.1
Crop N Need Minus Credits	(lb/acre)		197.0	197.0	186.7	181.5	178.9
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>(b) (6) 80</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
<b>Storage</b>			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
<b>Application Method</b>			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
<b>Storage/Application Method</b>				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + (OrgN * .35)	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	7.38
N App Rate ( $Crop\ N\ Need / 1st\ Yr\ Av\ N$ )	(1000 Gal/Acre or Ton/Acre)			26.7	25.3	24.6	24.2
P App Rate ( $Maintenance\ P / P\ in\ analysis$ )	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Prate	Prate	Prate	Prate
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>0.0</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>
Total application ( $App\ Rate * Spreadable\ Acres$ )	(Gallons or Tons)			446,225	446,225	446,225	446,225
N applied ( $1st\ Year\ AvN * App\ rate$ )	(Lbs/Acre)			70	70	70	70
P applied ( $P\ in\ manure * App\ rate$ )	(Lbs/Acre)			84	84	84	84
K applied ( $K\ in\ manure * App\ rate$ )	(Lbs/Acre)			123	123	123	123
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>197</b>	<b>127</b>	<b>117</b>	<b>112</b>	<b>109</b>
Acres Covered	(Acres)		0.0	47.3	47.3	47.3	47.3

**Individual Field Information****Rancho Cantera LLC**

Field Name:

(b) (6) South

Total Acres

68.2

Non-Spreadable Acres

1.3

Total Spreadable Acres

66.9

Township

Kent

Section

23

FSA Farm #

0

Predominant Soil Type:

675C2 Greenbush silt  
loam

FSA Tract #

0

P test

--

FSA Field #'s

0

K test

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**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	0.0	10.3	15.5	18.1
Total N Credits	(lb/acre)		0.0	0.0	10.3	15.5	18.1
Crop N Need Minus Credits	(lb/acre)		197.0	197.0	186.7	181.5	178.9
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>(b) (6) 80 South</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + ( $OrgN * .35$ )	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	7.38
N App Rate ( $Crop N Need / 1st Yr Av N$ )	(1000 Gal/Acre or Ton/Acre)			26.7	25.3	24.6	24.2
P App Rate ( $Maintenance P / P in analysis$ )	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Prate	Prate	Prate	Prate
<b>Application Rate to Use</b>	(1000 Gal or Ton)		<b>0.0</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>
Total application ( $App Rate * Spreadable Acres$ )	(Gallons or Tons)			631,374	631,374	631,374	631,374
N applied ( $1st Year AvN * App rate$ )	(Lbs/Acre)			70	70	70	70
P applied ( $P in manure * App rate$ )	(Lbs/Acre)			84	84	84	84
K applied ( $K in manure * App rate$ )	(Lbs/Acre)			123	123	123	123
<b>Additional N Needed</b>	(Lbs/Acre)		<b>197</b>	<b>127</b>	<b>117</b>	<b>112</b>	<b>109</b>
Acres Covered	(Acres)		0.0	66.9	66.9	66.9	66.9

**Individual Field Information****Rancho Cantera LLC**

Field Name:

(b) (6) 25

Total Acres

29.0

Non-Spreadable Acres

6.1

Total Spreadable Acres

22.9

Township

Kent

Section

14

FSA Farm #

0

Predominant Soil Type:

8451A Lawosn silt loam

FSA Tract #

0

P test

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FSA Field #'s

0

K test

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**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	0.0	0.0	10.3	15.5
Total N Credits	(lb/acre)		0.0	0.0	0.0	10.3	15.5
Crop N Need Minus Credits	(lb/acre)		197.0	197.0	197.0	186.7	181.5
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>(b) (6) 25</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method					LINE1	LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + (OrgN * .35)	(Lbs/1000 Gal or Lbs/Ton)				7.38	7.38	7.38
N App Rate (Crop N Need / 1st Yr Av N)	(1000 Gal/Acre or Ton/Acre)				26.7	25.3	24.6
P App Rate (Maintenance P / P in analysis)	(1000 Gal/Acre or Ton/Acre)				9.43	9.43	9.43
Apply at Prate or Nrate?					Prate	Prate	Prate
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>0.0</b>	<b>0.0</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>
Total application (App Rate * Spreadable Acres)	(Gallons or Tons)				216,086	216,086	216,086
N applied (1st Year AvN * App rate)	(Lbs/Acre)				70	70	70
P applied (P in manure * App rate)	(Lbs/Acre)				84	84	84
K applied (K in manure * App rate)	(Lbs/Acre)				123	123	123
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>197</b>	<b>197</b>	<b>127</b>	<b>117</b>	<b>112</b>
Acres Covered	(Acres)		0.0	0.0	22.9	22.9	22.9

**Individual Field Information****Rancho Cantera LLC****Field Name:****(b) (6)** 15**Total Acres**

17.5

**Non-Spreadable Acres**

2.1

**Total Spreadable Acres**

15.4

**Township**

Kent

**Section**

14

**FSA Farm #**

0

**Predominant Soil Type:**

279B Rozetta silt loam

**FSA Tract #**

0

**P test**

--

**FSA Field #'s**

0

**K test**

--

**Individual Field Application & Nutrients**

<b>Crop needs</b>	<b>Year</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	0.0	0.0	0.0	10.3
Total N Credits	(lb/acre)		0.0	0.0	0.0	0.0	10.3
Crop N Need Minus Credits	(lb/acre)		197.0	197.0	197.0	197.0	186.7
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor



<b>Rancho Cantera LLC</b>							
<b>(b) (6) 5</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method						LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + (OrgN * .35)	(Lbs/1000 Gal or Lbs/Ton)					7.38	7.38
N App Rate (Crop N Need / 1st Yr Av N)	(1000 Gal/Acre or Ton/Acre)					26.7	25.3
P App Rate (Maintenance P / P in analysis)	(1000 Gal/Acre or Ton/Acre)					9.43	9.43
Apply at Prate or Nrate?						Prate	Prate
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>9.4</b>	<b>9.4</b>
Total application (App Rate * Spreadable Acres)	(Gallons or Tons)					145,158	145,158
N applied (1st Year AvN * App rate)	(Lbs/Acre)					70	70
P applied (P in manure * App rate)	(Lbs/Acre)					84	84
K applied (K in manure * App rate)	(Lbs/Acre)					123	123
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>197</b>	<b>197</b>	<b>197</b>	<b>127</b>	<b>117</b>
Acres Covered	(Acres)		0.0	0.0	0.0	15.4	15.4

**Individual Field Information****Rancho Cantera LLC**

Field Name:

(b) (6) 90

Total Acres

83.4

Non-Spreadable Acres

0.0

Total Spreadable Acres

83.4

Township

Wards Grove

Section

9

FSA Farm #

0

Predominant Soil Type:

419C2 Flagg silt loam

FSA Tract #

0

P test

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FSA Field #'s

0

K test

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**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	23.6	22.1	21.4	21.1
Total N Credits	(lb/acre)		0.0	23.6	22.1	21.4	21.1
Crop N Need Minus Credits	(lb/acre)		197.0	173.4	174.9	175.6	175.9
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>(b) (6) 90</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + ( $OrgN * .35$ )	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	7.38
N App Rate ( $Crop N Need / 1st Yr Av N$ )	(1000 Gal/Acre or Ton/Acre)			23.5	23.7	23.8	23.8
P App Rate ( $Maintenance P / P in analysis$ )	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Prate	Prate	Prate	Prate
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>21.5</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>
Total application ( $App Rate * Spreadable Acres$ )	(Gallons or Tons)			786,907	786,907	786,907	786,907
N applied ( $1st Year AvN * App rate$ )	(Lbs/Acre)			70	70	70	70
P applied ( $P in manure * App rate$ )	(Lbs/Acre)			84	84	84	84
K applied ( $K in manure * App rate$ )	(Lbs/Acre)			123	123	123	123
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>38</b>	<b>104</b>	<b>105</b>	<b>106</b>	<b>106</b>
Acres Covered	(Acres)		83.4	83.4	83.4	83.4	83.4

**Individual Field Information****Rancho Cantera LLC****Field Name:**

(b) (6) 50

**Total Acres**

40.6

**Non-Spreadable Acres**

1.0

**Total Spreadable Acres**

39.6

**Township**

Kent

**Section**

15

**FSA Farm #**

0

**Predominant Soil Type:**

419C2 Flagg silt loam

**FSA Tract #**

0

**P test**

--

**FSA Field #'s**

0

**K test**

--

**Individual Field Application & Nutrients**

<b>Crop needs</b>	<b>Year</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	0.0	10.3	15.5	18.1
Total N Credits	(lb/acre)		0.0	0.0	10.3	15.5	18.1
Crop N Need Minus Credits	(lb/acre)		197.0	197.0	186.7	181.5	178.9
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

Rancho Cantera LLC							
(b) (6) 50		2009	2010	2011	2012	2013	2014
Manure Application		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + (OrgN * .35)	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	7.38
N App Rate (Crop N Need / 1st Yr Av N)	(1000 Gal/Acre or Ton/Acre)			26.7	25.3	24.6	24.2
P App Rate (Maintenance P / P in analysis)	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Prate	Prate	Prate	Prate
Application Rate to Use	(1000 Gal or Ton)		0.0	9.4	9.4	9.4	9.4
Total application (App Rate * Spreadable Acres)	(Gallons or Tons)			373,882	373,882	373,882	373,882
N applied (1st Year AvN * App rate)	(Lbs/Acre)			70	70	70	70
P applied (P in manure * App rate)	(Lbs/Acre)			84	84	84	84
K applied (K in manure * App rate)	(Lbs/Acre)			123	123	123	123
Additional N Needed	(Lbs/Acre)		197	127	117	112	109
Acres Covered	(Acres)		0.0	39.6	39.6	39.6	39.6

**Individual Field Information****Rancho Cantera LLC**

Field Name:

(b) (6) 60

Total Acres

134.7

Non-Spreadable Acres

1.2

Total Spreadable Acres

133.5

Township

Wards Grove

Section

16

FSA Farm #

0

Predominant Soil Type:

419C2 Flagg silt loam

FSA Tract #

0

P test

--

FSA Field #'s

0

K test

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**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	14.2	17.4	19.0	19.9
Total N Credits	(lb/acre)		0.0	14.2	17.4	19.0	19.9
Crop N Need Minus Credits	(lb/acre)		197.0	182.8	179.6	178.0	177.1
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>(b) (6) 60</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + (OrgN * .35)	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	7.38
N App Rate (Crop N Need / 1st Yr Av N)	(1000 Gal/Acre or Ton/Acre)			24.8	24.3	24.1	24.0
P App Rate (Maintenance P / P in analysis)	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Prate	Prate	Prate	Prate
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>12.9</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>
Total application (App Rate * Spreadable Acres)	(Gallons or Tons)			1,254,806	1,259,070	1,259,070	1,259,070
N applied (1st Year AvN * App rate)	(Lbs/Acre)			69	70	70	70
P applied (P in manure * App rate)	(Lbs/Acre)			84	84	84	84
K applied (K in manure * App rate)	(Lbs/Acre)			123	123	123	123
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>102</b>	<b>113</b>	<b>110</b>	<b>108</b>	<b>108</b>
Acres Covered	(Acres)		133.5	133.5	133.5	133.5	133.5



**Individual Field Information****Rancho Cantera LLC****Field Name:****(b) (6)** 40**Total Acres**

40.7

**Non-Spreadable Acres**

1.0

**Total Spreadable Acres**

39.7

**Township**

Wards Grove

**Section**

9

**FSA Farm #**

0

**Predominant Soil Type:**

279B Rozetta silt loam

**FSA Tract #**

0

**P test**

--

**FSA Field #'s**

0

**K test**

--

**Individual Field Application & Nutrients**

<b>Crop needs</b>	<b>Year</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)		195	195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	0.0	10.3	15.5	18.1
Total N Credits	(lb/acre)		0.0	0.0	10.3	15.5	18.1
Crop N Need Minus Credits	(lb/acre)		197.0	197.0	186.7	181.5	178.9
Maintenance P needed *	(lb/acre)		83.9	83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

<b>Rancho Cantera LLC</b>							
<b>40</b>		<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Manure Application</b>		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + (OrgN * .35)	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	7.38
N App Rate (Crop N Need / 1st Yr Av N)	(1000 Gal/Acre or Ton/Acre)			26.7	25.3	24.6	24.2
P App Rate (Maintenance P / P in analysis)	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Prate	Prate	Prate	Prate
<b>Application Rate to Use</b>	<b>(1000 Gal or Ton)</b>		<b>0.0</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>	<b>9.4</b>
Total application (App Rate * Spreadable Acres)	(Gallons or Tons)			374,637	374,637	374,637	374,637
N applied (1st Year AvN * App rate)	(Lbs/Acre)			70	70	70	70
P applied (P in manure * App rate)	(Lbs/Acre)			84	84	84	84
K applied (K in manure * App rate)	(Lbs/Acre)			123	123	123	123
<b>Additional N Needed</b>	<b>(Lbs/Acre)</b>		<b>197</b>	<b>127</b>	<b>117</b>	<b>112</b>	<b>109</b>
Acres Covered	(Acres)		0.0	39.7	39.7	39.7	39.7

**Individual Field Information****Rancho Cantera LLC****Field Name:**

(b) (6) 160

**Total Acres**

147.9

**Non-Spreadable Acres**

0.0

**Total Spreadable Acres**

147.9

**Township**

Wards Grove

**Section**

8

**FSA Farm #**

0

**Predominant Soil Type:**

61B Atterberry silt loam

**FSA Tract #**

0

**P test**

--

**FSA Field #'s**

0

**K test**

--

**Individual Field Application & Nutrients**

<b>Crop needs</b>	<b>Year</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Crop</b>		Corn	Corn	Corn	Corn	Corn	Corn
<b>Yield</b>	(bu/acre OR ton/acre)		195	195	195	195	195
<b>N needed (lbs/ac)</b>	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	0.0	10.3	15.5	18.1
<b>Total N Credits</b>	(lb/acre)		0.0	0.0	10.3	15.5	18.1
<b>Crop N Need Minus Credits</b>	(lb/acre)		197.0	197.0	186.7	181.5	178.9
<b>Maintenance P needed *</b>	(lb/acre)		83.9	83.9	83.9	83.9	83.9
<b>Maintenance K needed *</b>	(lb/acre)		54.6	54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

Rancho Cantera LLC							
(b) (6) 160		2009	2010	2011	2012	2013	2014
Manure Application		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + ( $OrgN * .35$ )	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	7.38
N App Rate ( $Crop N Need / 1st Yr Av N$ )	(1000 Gal/Acre or Ton/Acre)			26.7	25.3	24.6	24.2
P App Rate ( $Maintenance P / P in analysis$ )	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Prate	Prate	Prate	Prate
Application Rate to Use	(1000 Gal or Ton)		0.0	9.4	9.4	9.4	9.4
Total application ( $App Rate * Spreadable Acres$ )	(Gallons or Tons)			1,395,362	1,395,362	1,395,362	1,395,362
N applied ( $1st Year AvN * App rate$ )	(Lbs/Acre)			70	70	70	70
P applied ( $P in manure * App rate$ )	(Lbs/Acre)			84	84	84	84
K applied ( $K in manure * App rate$ )	(Lbs/Acre)			123	123	123	123
Additional N Needed	(Lbs/Acre)		197	127	117	112	109
Acres Covered	(Acres)		0.0	147.9	147.9	147.9	147.9

**Individual Field Information****Rancho Cantera LLC**

Field Name: (b) (6) 95

Total Acres 78.9

Non-Spreadable Acres 1.9

Total Spreadable Acres 77.0

Township Wards Grove

Section 2

FSA Farm # 0

Predominant Soil Type: 279B Rozetta silt loam

FSA Tract # 0

P test --

FSA Field #'s 0

K test --

**Individual Field Application & Nutrients**

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Corn	Corn	Corn	Corn	Corn	Corn
Yield	(bu/acre OR ton/acre)			195	195	195	195
N needed (lbs/ac)	lbs/ac		197	197	197	197	197
- Legume N credits	(lb/acre)			0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)			0.0	10.3	15.5	18.1
Total N Credits	(lb/acre)			0.0	10.3	15.5	18.1
Crop N Need Minus Credits	(lb/acre)			197.0	186.7	181.5	178.9
Maintenance P needed *	(lb/acre)			83.9	83.9	83.9	83.9
Maintenance K needed *	(lb/acre)			54.6	54.6	54.6	54.6

\* Maintenance P &amp; K needed are listed for calculation &amp; uptake purposes only

\*\* Manure N carryover credit = Previous years' apps \* Org N \* Mineralization factor

Rancho Cantera LLC							
(b) (6) 95		2009	2010	2011	2012	2013	2014
Manure Application		Corn	Corn	Corn	Corn	Corn	Corn
Storage			Holding Pond	Holding Pond	Holding Pond	Holding Pond	Holding Pond
Application Method			Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Storage/Application Method				LINE1	LINE1	LINE1	LINE1
1st Year Available N ( $Am-N * N$ retention due to app method) + (OrgN * .35)	(Lbs/1000 Gal or Lbs/Ton)			7.38	7.38	7.38	7.38
N App Rate (Crop N Need / 1st Yr Av N)	(1000 Gal/Acre or Ton/Acre)			26.7	25.3	24.6	24.2
P App Rate (Maintenance P / P in analysis)	(1000 Gal/Acre or Ton/Acre)			9.43	9.43	9.43	9.43
Apply at Prate or Nrate?				Prate	Prate	Prate	Prate
Application Rate to Use	(1000 Gal or Ton)		0.0	9.4	9.4	9.4	9.4
Total application (App Rate * Spreadable Acres)	(Gallons or Tons)			726,543	726,543	726,543	726,543
N applied (1st Year AvN * App rate)	(Lbs/Acre)			70	70	70	70
P applied (P in manure * App rate)	(Lbs/Acre)			84	84	84	84
K applied (K in manure * App rate)	(Lbs/Acre)			123	123	123	123
Additional N Needed	(Lbs/Acre)			127	117	112	109
Acres Covered	(Acres)		0.0	77.0	77.0	77.0	77.0

Planned Applications  
Rancho Cantera LLC  
CROP YEAR 2011

<u>Field</u>	<u>Planned Acres</u>	<u>Crop</u>	<u>Planned Manure Source</u>	<u>Actual Manure Source</u>	<u>Planned Manure (1000 Gal/Acre)</u>	<u>Actual Manure (1000 Gal/Acre)</u>	<u>Planned Total Manure (Gallons)</u>	<u>Actual Total Manure (Gallons)</u>
R/C 116	0.0	Corn	Holding Pond		9.4		1,059,490	
R/C 19.1	0.0	Corn						
R/C 40	41.8	Corn	Holding Pond		15.0		626,400	
R/C 8.1	8.1	Corn	Holding Pond		15.0		121,500	
R/C 2.5	0.0	Corn						
R/C 24.2	24.2	Corn	Holding Pond		9.4		228,253	
R/C 4.9	0.0	Corn						
(b) (6)	61.4	Corn	Holding Pond		21.3		1,306,549	
(b) (6)	76.1	Corn	Holding Pond		20.6		1,565,226	
(b) (6)	56.4	Corn	Holding Pond		21.2		1,192,989	
(b) (6)	4.9	Corn	Holding Pond		21.6		105,887	
(b) (6)	24.5	Corn	Holding Pond		19.5		478,399	
(b) (6)	60.1	Corn	Holding Pond		20.2		1,213,439	
(b) (6)	74.6	Corn	Holding Pond		20.1		1,500,000	
(b) (6)	24.6	Corn	Holding Pond		9.4		232,403	
(b) (6)	85.3	Corn	Holding Pond		9.4		804,639	
(b) (6)	47.3	Corn	Holding Pond		9.4		446,225	

CROP YEAR 2011

Field	<u>Planned Acres</u>	<u>Crop</u>	<u>Planned Manure Source</u>	<u>Actual Manure Source</u>	<u>Planned Manure (1000 Gal/Acre)</u>	<u>Actual Manure (1000 Gal/Acre)</u>	<u>Planned Total Manure (Gallons)</u>	<u>Actual Total Manure (Gallons)</u>
(b) (6)	66.9	Corn	Holding Pond		9.4		631,374	
	0.0	Corn						
	0.0	Corn						
	83.4	Corn	Holding Pond		9.4		786,907	
	39.6	Corn	Holding Pond		9.4		373,882	
	133.5	Corn	Holding Pond		9.4		1,254,806	
	39.7	Corn	Holding Pond		9.4		374,637	
	147.9	Corn	Holding Pond		9.4		1,395,362	
	77.0	Corn	Holding Pond		9.4		726,543	



Planned Applications  
Rancho Cantera LLC  
CROP YEAR 2012

<u>Field</u>	<u>Planned Acres</u>	<u>Crop</u>	<u>Planned Manure Source</u>	<u>Actual Manure Source</u>	<u>Planned Manure (1000 Gal/Acre)</u>	<u>Actual Manure (1000 Gal/Acre)</u>	<u>Planned Total Manure (Gallons)</u>	<u>Actual Total Manure (Gallons)</u>
R/C 116	112.3	Corn	Holding Pond		9.4		1,059,490	
R/C 19.1	19.1	Corn	Holding Pond		9.4		179,773	
R/C 40	41.8	Corn	Holding Pond		23.3		972,728	
R/C 8.1	0.0	Corn						
R/C 2.5	0.0	Corn						
R/C 24.2	24.2	Corn	Holding Pond		9.4		228,253	
R/C 4.9	4.9	Corn	Holding Pond		9.4		46,217	
(b) (6)	61.4	Corn	Holding Pond		18.6		1,140,759	
(b) (6)	76.1	Corn	Holding Pond		18.4		1,400,558	
(b) (6)	53.9	Corn	Holding Pond		18.5		1,000,000	
(b) (6)	4.9	Corn	Holding Pond		18.7		91,436	
(b) (6)	24.5	Corn	Holding Pond		18.1		444,626	
(b) (6)	60.1	Corn	Holding Pond		18.3		1,100,641	
(b) (6)	81.9	Corn	Holding Pond		18.3		1,500,000	
(b) (6)	24.6	Corn	Holding Pond		9.4		232,403	
(b) (6)	85.3	Corn	Holding Pond		9.4		804,639	
(b) (6)	47.3	Corn	Holding Pond		9.4		446,225	

CROP YEAR 2012

Field	<u>Planned Acres</u>	<u>Crop</u>	<u>Planned Manure Source</u>	<u>Actual Manure Source</u>	<u>Planned Manure (1000 Gal/Acre)</u>	<u>Actual Manure (1000 Gal/Acre)</u>	<u>Planned Total Manure (Gallons)</u>	<u>Actual Total Manure (Gallons)</u>
(b) (6)	66.9	Corn	Holding Pond		9.4		631,374	
	22.9	Corn	Holding Pond		9.4		216,086	
	0.0	Corn						
	83.4	Corn	Holding Pond		9.4		786,907	
	39.6	Corn	Holding Pond		9.4		373,882	
	133.5	Corn	Holding Pond		9.4		1,259,070	
	39.7	Corn	Holding Pond		9.4		374,637	
	147.9	Corn	Holding Pond		9.4		1,395,362	
	77.0	Corn	Holding Pond		9.4		726,543	

Planned Applications  
Rancho Cantera LLC  
CROP YEAR 2013

<u>Field</u>	<u>Planned Acres</u>	<u>Crop</u>	<u>Planned Manure Source</u>	<u>Actual Manure Source</u>	<u>Planned Manure (1000 Gal/Acre)</u>	<u>Actual Manure (1000 Gal/Acre)</u>	<u>Planned Total Manure (Gallons)</u>	<u>Actual Total Manure (Gallons)</u>
R/C 116	112.3	Corn	Holding Pond		9.4		1,059,490	
R/C 19.1	19.1	Corn	Holding Pond		9.4		179,773	
R/C 40	41.8	Corn	Holding Pond		21.5		899,050	
R/C 8.1	8.1	Corn	Holding Pond		25.6		207,159	
R/C 2.5	2.5	Corn	Holding Pond		9.4		23,580	
R/C 24.2	0.0	Corn						
R/C 4.9	0.0	Corn						
(b) (6)	61.4	Corn	Holding Pond		17.9		1,099,979	
	76.1	Corn	Holding Pond		17.9		1,360,055	
	56.4	Corn	Holding Pond		17.9		1,009,971	
	4.9	Corn	Holding Pond		17.9		87,881	
	24.5	Corn	Holding Pond		17.8		436,319	
	0.0	Corn						
	142.7	Corn	Holding Pond		17.8		2,547,634	
	24.6	Corn	Holding Pond		9.4		232,403	
	85.3	Corn	Holding Pond		9.4		804,639	
	47.3	Corn	Holding Pond		9.4		446,225	

CROP YEAR 2013

<u>Field</u>	<u>Planned Acres</u>	<u>Crop</u>	<u>Planned Manure Source</u>	<u>Actual Manure Source</u>	<u>Planned Manure (1000 Gal/Acre)</u>	<u>Actual Manure (1000 Gal/Acre)</u>	<u>Planned Total Manure (Gallons)</u>	<u>Actual Total Manure (Gallons)</u>
(b) (6)	66.9	Corn	Holding Pond		9.4		631,374	
	22.9	Corn	Holding Pond		9.4		216,086	
	15.4	Corn	Holding Pond		9.4		145,158	
	83.4	Corn	Holding Pond		9.4		786,907	
	39.6	Corn	Holding Pond		9.4		373,882	
	133.5	Corn	Holding Pond		9.4		1,259,070	
	39.7	Corn	Holding Pond		9.4		374,637	
	147.9	Corn	Holding Pond		9.4		1,395,362	
	77.0	Corn	Holding Pond		9.4		726,543	

Planned Applications  
Rancho Cantera LLC  
CROP YEAR 2014

<u>Field</u>	<u>Planned Acres</u>	<u>Crop</u>	<u>Planned Manure Source</u>	<u>Actual Manure Source</u>	<u>Planned Manure (1000 Gal/Acre)</u>	<u>Actual Manure (1000 Gal/Acre)</u>	<u>Planned Total Manure (Gallons)</u>	<u>Actual Total Manure (Gallons)</u>
R/C 116	112.3	Corn	Holding Pond		9.4		1,059,490	
R/C 19.1	19.1	Corn	Holding Pond		9.4		179,773	
R/C 40	0.0	Corn						
R/C 8.1	8.1	Corn	Holding Pond		22.3		180,879	
R/C 2.5	2.5	Corn	Holding Pond		9.4		23,580	
R/C 24.2	24.2	Corn	Holding Pond		9.4		228,253	
R/C 4.9	4.9	Corn	Holding Pond		9.4		46,060	
(b) (6)	61.4	Corn	Holding Pond		17.8		1,089,949	
	76.1	Corn	Holding Pond		13.1		1,000,000	
	56.4	Corn	Holding Pond		17.7		1,001,084	
	0.0	Corn						
	24.5	Corn	Holding Pond		17.7		434,275	
	60.1	Corn	Holding Pond		22.3		1,338,621	
	142.7	Corn	Holding Pond		17.7		2,526,498	
	24.6	Corn	Holding Pond		9.4		232,403	
	85.3	Corn	Holding Pond		9.4		804,639	
	47.3	Corn	Holding Pond		9.4		446,225	